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INDIAN MEDICAL ASSOCIATION

VOLUME 34 NUMBER 1 CALCUTTA JANUARY 1, 1960

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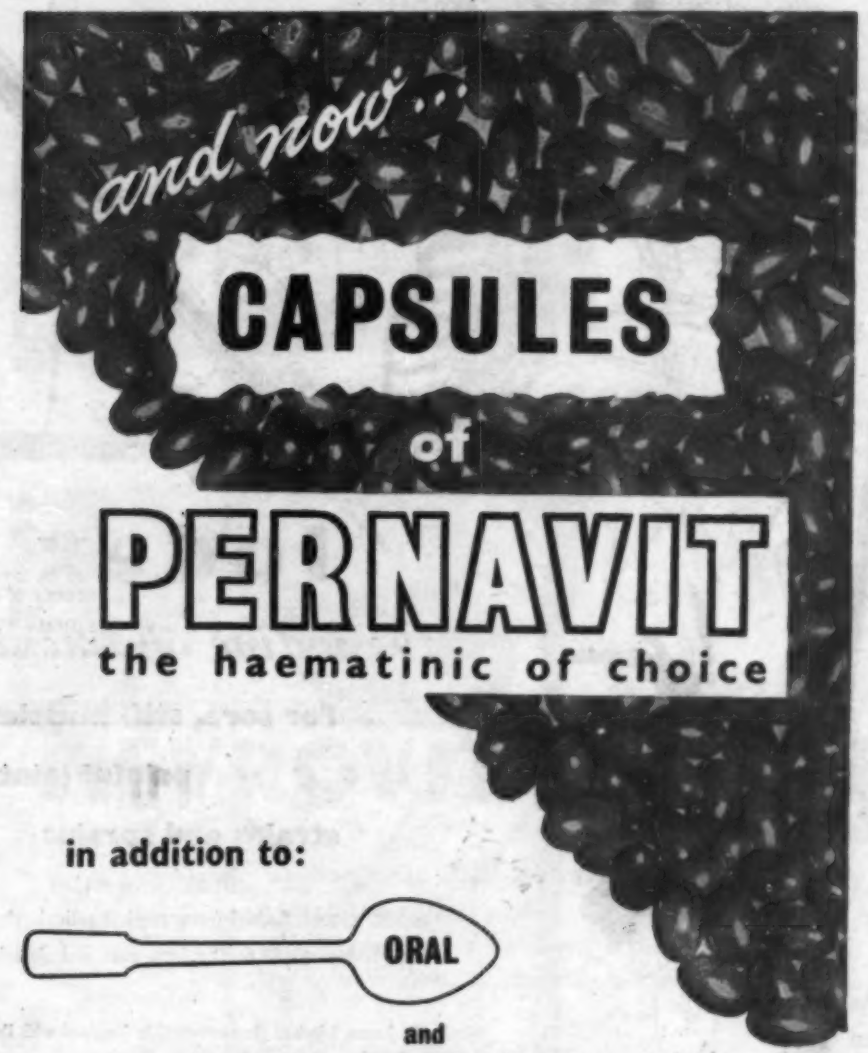

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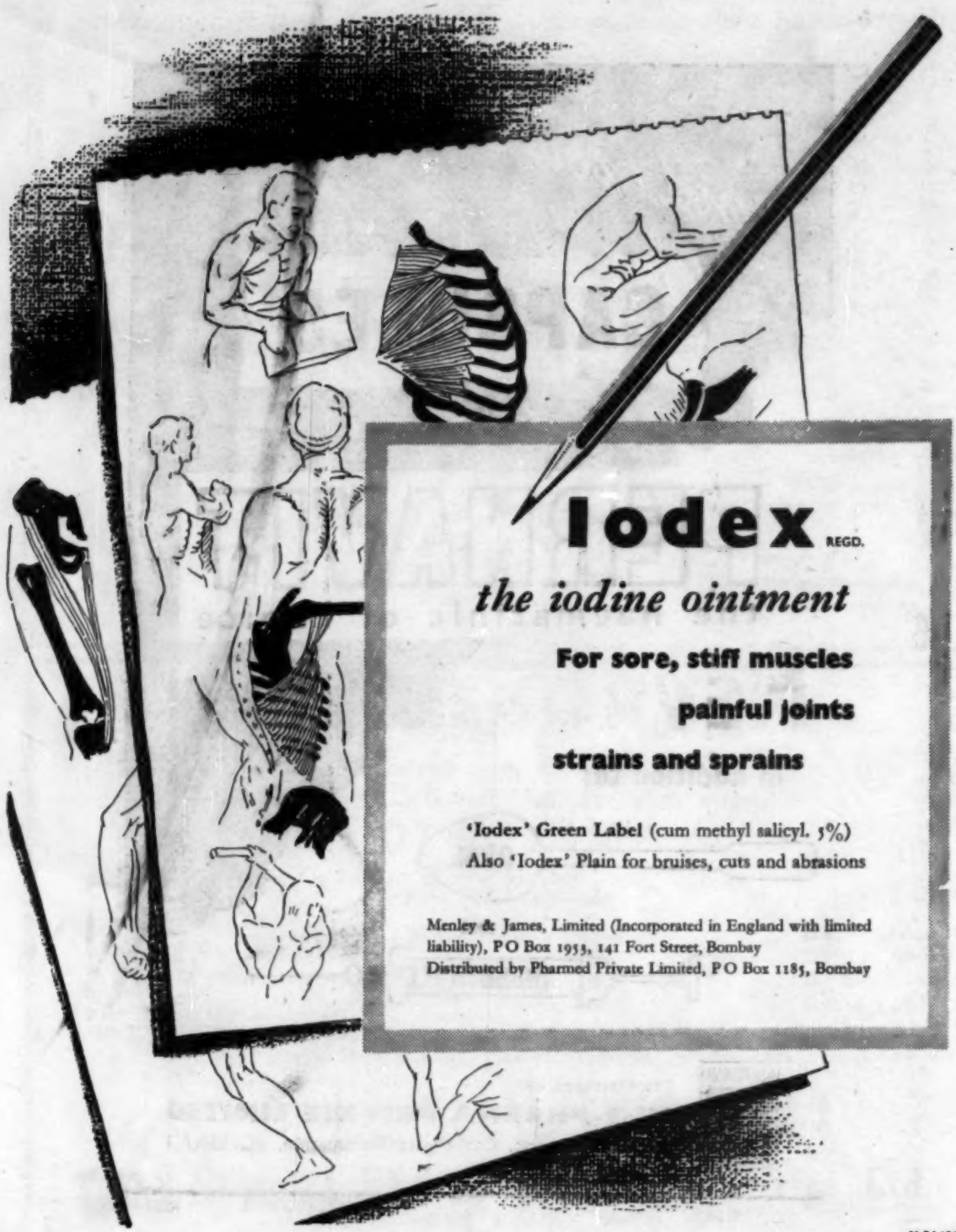
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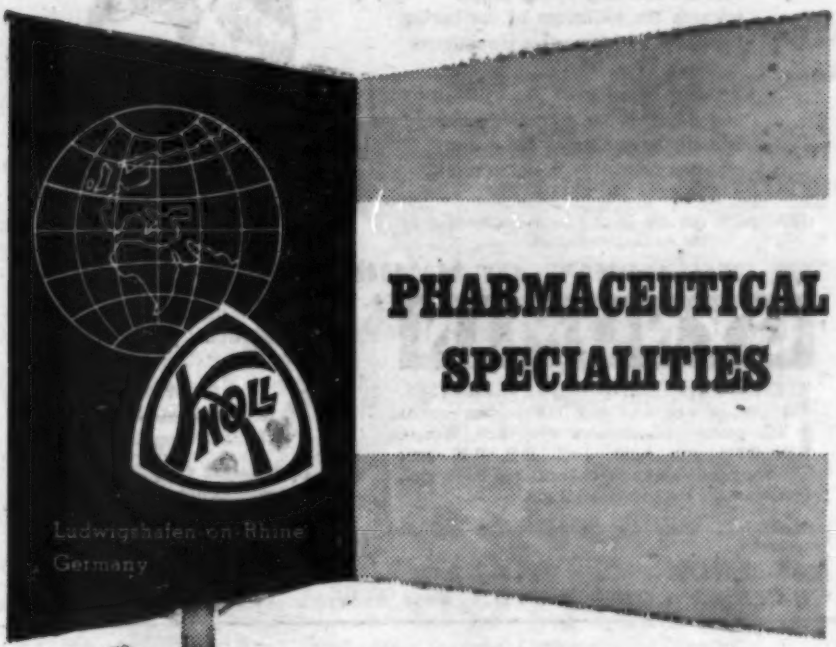

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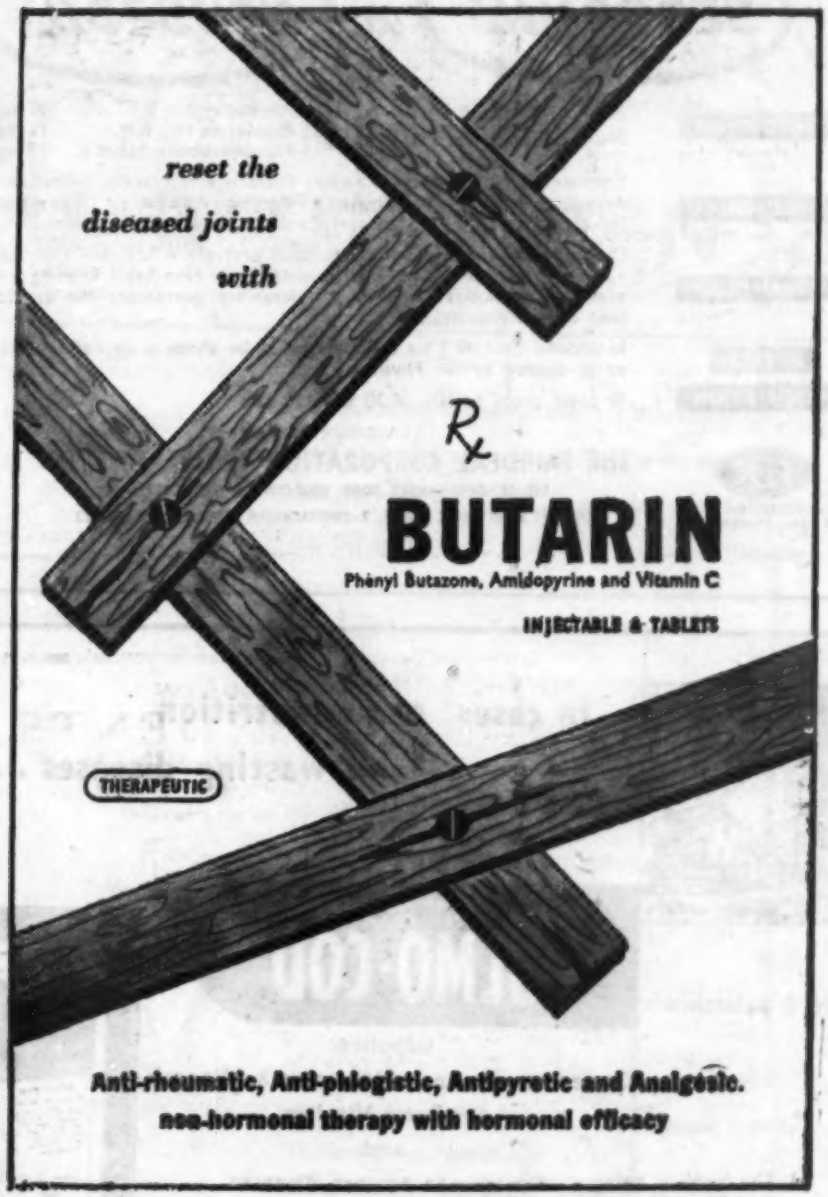
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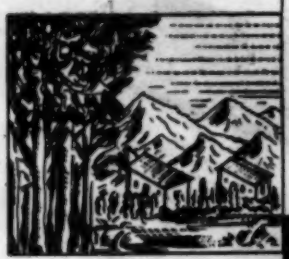

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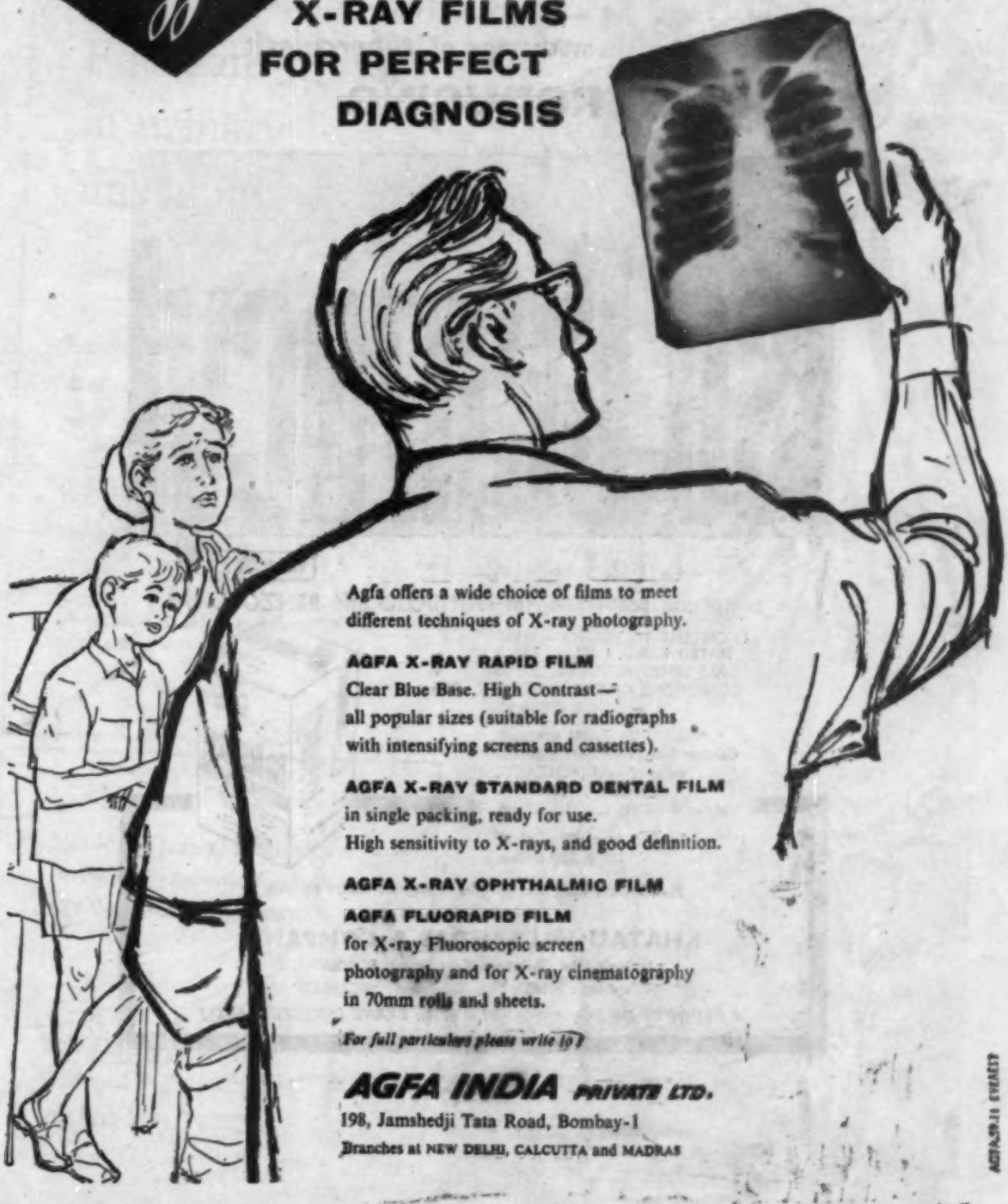

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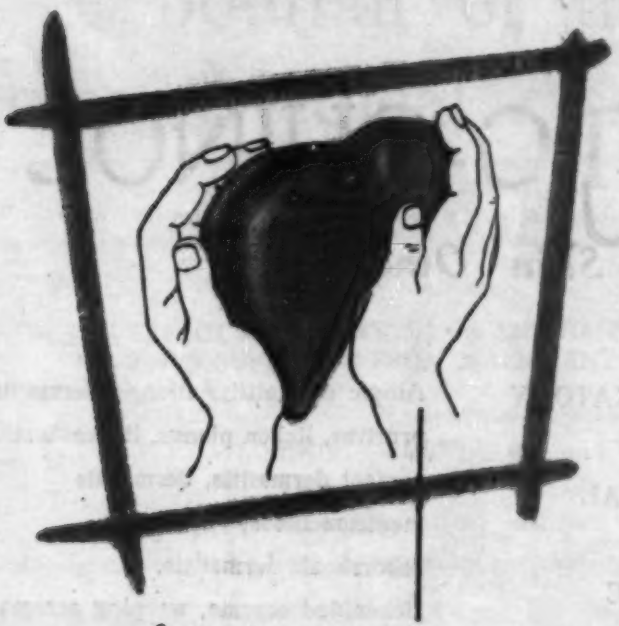

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ORIGINAL ARTICLES

STUDY ON THE EFFECT OF RADIATION ON THE HAEMOPOIETIC SYSTEM IN PATIENTS SUFFERING FROM MALIGNANT DISEASES

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The effect of radiation on blood is important from both radiotherapeutic and clinical standpoints. The subject was taken up with the idea to get an insight into the changes of different cellular elements of blood. The radiation effect on the haemopoietic system still remains an open question. Some are of opinion that radiation produces leucopenia while "Phillips (1933) is of opinion that leucopenia did not occur and a low lymphocyte count was found in most of the cases of malignant diseases, but the effect of large doses used was very definitely not the production of lymphopenia". It is for this that the present work was undertaken in our laboratory.

MATERIAL AND METHODS

This investigation comprised a group of 50 patients suffering from malignant diseases affecting the various parts of the body : head and neck—37 cases ; thorax—5 cases ; pelvis—8 cases. Histologically proved malignant cases were taken up. They were of different age-groups and both sexes. We were not so much interested in the character of the lesion treated as in the part of the body receiving the irradiation, since it was our desire to know whether the effect on the blood varied with the part of the body treated. The type of radiation comprised deep roentgen therapy by 200-250 kv. machine with HVL varying between 1·5 mm of Cu and 1·75 mm. of Cu and million-volt machine with HVL of 10 mm. of Cu. The amount of roentgen radiation varied from 0·329 to 19·94 mega gram roentgen. In each and every case the integral dose was calculated by graphical integration using the isodose chart. The duration of time during which the irradiation was administered varied from two to five weeks. Prior to the institution of the therapy complete blood counts were made in each case. To eliminate the effects of digestion and of diurnal variation of leucocytes, a morning count was made under basal condition, i.e., before breakfast. These were followed by counts made at weekly intervals during the course of irradiation. All studies included red and white cell counts and haemoglobin determination by standard methods and by Sahli's method respectively. The differential counts of leucocytes were done by counting 200 leucocytes.

RESULTS

The preradiation blood picture indicates the condition of the haemopoietic system under the influence of malignant diseases. With radiation the diseased condition improves but the effect of roentgen rays depresses the haemopoietic system resulting in the available changes in haemogram.

The results obtained are given in Tables 1-6 :

TABLE 1—GIVING COMPLETE DATA IN REGARD TO THE EFFECT OF RADIATION ON BLOOD COUNT IN 50 CASES ARRANGED ACCORDING TO THE AREA TREATED

Serial No.	Age	Sex	Diagnosis	Amount of radiation in mega-g. roentgen	Haemoglobin in g. per cent		R.B.C. in million		Neutrophils		Lymphocytes		Monocytes		Eosinophils		Remarks
					Before radiation	After radiation	Before radiation	After radiation	Before radiation	After radiation	Before radiation	After radiation	Before radiation	After radiation	Before radiation	After radiation	
200/250 KILOVOLTS																	
								PELVIC AREA									
1	38	F	Cancer cervix	4·04	11·56	10·88	4·25	3·66	3185	3580	931	326	147	—	637	744	No improvement
2	42	F	,,	4·88	11·22	11·05	4·23	3·50	4724	3542	1944	414	144	—	288	508	—do—
3	36	F	,,	5·05	11·39	10·88	3·56	3·55	5297	5185	978	325	82	114	1793	56	—do—
4	46	F	,,	10·51	11·05	11·73	4·13	3·93	2310	4465	1085	188	—	—	105	47	—do—
5	48	M	Teratoma testes	12·81	16·32	17·51	5·78	5·67	3969	4032	392	192	—	48	539	528	Marked improvement
6	56	M	Seminoma testes	18·55	13·74	13·26	4·44	4·30	7084	5280	1104	1020	—	120	1012	480	—do—
7	50	M	Papilloma lt. kidney	14·50	12·38	11·56	4·36	4·88	4832	2997	806	162	—	—	496	850	No improvement
								HEAD AND NECK AREA									
8	60	M	Cancer larynx	5·64	12·58	13·60	4·15	4·88	5550	4428	1725	702	—	—	225	270	Partial improvement
9	48	M	Cancer cheek	3·78	13·26	13·26	5·13	4·95	8944	6675	2804	1246	—	—	1602	979	—do—
10	51	M	Cancer epiglottis	2·43	11·20	13·26	3·81	4·00	15907	4237	1940	1357	—	—	355	56	Good improvement
11	52	M	Cancer cheek	—	12·24	12·60	3·91	4·10	8288	4305	1600	763	240	—	560	381	Partial improvement
12	35	M	Cancer tonsil	4·25	14·96	17·00	5·09	5·74	10493	3268	1342	516	122	43	244	473	—do—
13	30	M	Cancer antrum	—	13·26	12·58	4·04	3·50	6929	5246	1437	610	—	—	84	244	No improvement
14	56	M	Cancer neck	2·24	14·96	15·64	4·82	5·98	10704	8730	2574	873	—	—	172	97	—do—
15	60	M	Cancer pharynx	3·24	13·94	14·62	4·26	5·02	3672	4120	1071	402	—	—	357	1177	Improved
16	40	M	Cancer larynx	—	15·13	15·47	4·92	5·27	4221	8787	1498	1303	—	—	378	540	Died
17	52	M	—do—	2·61	14·96	15·64	4·82	5·98	5505	5005	1551	1183	72	33	72	296	Partial improvement
18	32	M	Lymphosarcoma neck	1·64	13·94	14·62	4·26	5·02	2520	5090	2310	725	73	—	420	435	Good improvement
19	58	M	Cancer cheek	—	15·13	15·47	4·92	5·27	5438	6723	1573	1328	73	—	216	166	No improvement
20	47	M	Lymphosarcoma neck	3·25	10·88	14·11	4·04	4·42	7350	2184	2520	224	105	—	525	364	Improved
21	56	M	Cancer larynx	1·76	12·02	13·60	4·57	4·30	5417	3195	1738	491	—	77	695	423	Improved
22	52	M	Cancer cheek	5·8	6·80	11·73	1·87	3·10	5360	6264	1600	957	—	—	1040	1392	Marked improvement
23	40	M	—do—	3·22	14·96	15·81	5·21	6·20	4752	5278	1452	232	—	—	330	232	—do—

TABLE I—*Contd.*

Serial No.	Age	Sex	Diagnosis	Amount of radiation in mega-g. roentgen	Haemoglobin in g. per cent		R.B.C. in million		Neutrophils		Lymphocytes		Monocytes		Eosinophils		Remarks
					Before radiation	After radiation	Before radiation	After radiation	Before radiation	After radiation	Before radiation	After radiation	Before radiation	After radiation	Before radiation	After radiation	
24	49	M	Cancer larynx	2·5	13·77	14·62	4·77	4·67	6162	5073	1501	513	—	—	237	57	Partial improvement
25	46	M	Cancer alveolar margin	—	12·41	11·90	4·31	3·97	9317	11532	2057	744	61	—	665	124	—do—
26	48	M	Cancer cheek	0·33	14·79	14·96	4·60	4·50	5795	5772	1995	666	—	—	1710	888	Improved
27	48	M	—do—	0·84	13·26	14·62	3·95	4·70	6660	5772	1170	666	—	—	1170	888	—do—
28	52	M	Cancer tonsil	6·05	18·19	16·40	5·60	4·81	5082	5521	1004	285	63	57	126	171	No improvement
29	50	M	Cancer larynx	1·99	14·11	12·41	5·68	6·54	9372	5811	1171	894	—	223	107	522	—do—
30	56	M	Cancer cheek	3·63	15·74	13·96	4·94	4·83	5402	9114	876	490	—	—	949	196	—do—
31	46	M	Cancer larynx	4·46	15·47	15·64	5·56	5·16	6122	4860	1431	162	70	54	318	324	Improved
32	48	M	—do—	1·96	13·60	12·41	4·42	4·72	5354	4842	1258	603	74	63	814	630	No improvement
33	54	M	Cancer tonsil	3·76	14·11	14·62	5·28	5·76	7526	4577	2120	622	212	56	742	282	Improved
34	56	M	Cancer larynx	4·23	15·47	14·62	7·14	5·18	7254	5586	1488	309	93	66	465	466	Improved
35	50	M	Cancer tonsil, base of tongue	5·52	16·83	15·98	6·56	5·85	10760	8232	2556	686	—	—	134	882	Improved
36	55	M	Cancer larynx	0·89	15·30	14·45	4·64	4·11	5622	5057	1200	656	225	—	450	238	Marked improvement
37	50	M	—do—	2·86	13·26	14·62	4·17	4·78	5024	3514	1202	792	17	—	778	644	Improved
38	56	M	—do—	2·30	13·43	12·92	4·66	4·17	5446	7138	2227	830	—	83	577	249	No improvement
39	44	M	—do—	2·66	14·11	14·11	5·19	4·53	5292	6398	504	474	—	—	504	1027	Improved
40	46	F	Cancer breast	12·55	10·88	10·88	4·25	4·33	5693	5440	1898	364	82	—	495	576	Partial improvement
1000 KILOVOLTS																	
							HEAD AND NECK AREA										
1	48	M	Cancer larynx	3·81	11·90	6·96	4·79	2·35	3542	5848	874	372	—	—	184	—	No improvement
2	50	M	Cancer tonsil	4·41	11·56	12·58	3·78	4·71	4970	1824	1330	672	70	—	560	704	Good improvement
3	36	M	Cancer alveolar margin	2·87	13·77	14·28	4·33	4·55	4440	4292	1044	1365	—	195	956	292	Improvement
4	50	M	Cancer larynx	6·16	13·77	13·94	4·99	4·17	7898	7820	1365	805	195	—	292	85	No improvement
5	42	M	Cancer tongue	10·08	18·19	18·13	5·28	5·42	4360	3697	382	261	—	44	709	348	No improvement

TABLE 1—*Contd.*

Serial No.	Age	Sex	Diagnosis	Amount of radiation in mega-g. roentgen	Haemoglobin in g. per cent		R.B.C. in million		Neutrophils		Lymphocytes		Monocytes		Eosinophils		Remarks
					Before radiation	After radiation	Before radiation	After radiation	Before radiation	After radiation	Before radiation	After radiation	Before radiation	After radiation	Before radiation	After radiation	
					THORACIC AREA												
6	48	M	Cancer bronchogenic	10·72	12·24	11·60	5·50	4·96	5075	5192	1450	708	290	—	435	—	No improvement
7	52	M	—do—	17·31	14·11	14·79	4·88	4·94	4018	6517	588	133	—	—	245	—	Partial improvement
8	44	M	—do—	19·94	9·18	11·39	3·12	3·98	7600	4271	1200	409	200	—	1000	1170	Improved
9	56	M	—do—	11·73	12·24	13·77	4·11	4·17	9834	4414	1105	191	—	97	111	145	No improvement
					PELVIC AREA												
10	36	M	Seminoma testes	—	14·45	13·77	5·08	4·12	5016	3726	1056	122	—	—	528	202	Good improvement

TABLE 2—EFFECT OF RADIATION ON HAEMOGLOBIN CONTENT

	No. of patients	Effect of radiation on Hb.				
		Increase		No change	Decrease	
		1+	2+		1−	2−
250 kv. ...	40	6	1	24	9	0
1000 kv. ...	10	3	0	5	1	1

1+ = Slight increase upto 3 g. above preradiation level
2+ = Moderate increase between 3 and 6 g. preradiation level
1− = Slight decrease less than 3 g. below preradiation level
2− = Moderate decrease between 3 and 6 g. below preradiation level.

It will be noted that in majority of patients, there was no change either in the haemoglobin level (Table 2) or in the erythrocyte count (Table 3) during radiation. In some cases in which there was a decrease of either haemoglobin or the red cells the change was of minor degree. These studies indicate that irradiation as employed therapeutically has no significant effect on either the haemoglobin content or the red cell count of blood.

TABLE 3—EFFECT OF RADIATION ON RED CELLS

	No. of patients	Effect of radiation on R.B.C.				
		Increase		No change	Decrease	
		1+	2+		1−	2−
250 kv. ...	40	4	2	24	9	1
1000 kv. ...	10	2	0	6	1	1

1+ = Slight increase upto one million
2+ = Moderate increase between 1 and 2 million
1− = Slight decrease less than 1 million
2− = Moderate decrease between 1 and 2 million

TABLE 4—EFFECT OF RADIATION ON NEUTROPHILIC COUNT

	No. of patients	Effect of radiation on neutrophils				
		Increase		No change	Decrease	
		1+	2+		1−	2−
250 kv. ...	40	5	nil	27	3	5
1000 kv. ...	10	2	nil	5	2	1

No change = Variation up to 1000 cells on either side (increase or decrease)
1± = Increase or decrease of between 1000 and 2000 cells
2± = Increase or decrease of more than 2000 cells

TABLE 5—EFFECT OF RADIATION ON LYMPHOCYTES

	No. of patients	Effect of radiation on lymphocytes				
		Increase		No change	Decrease	
		1+	2+		1−	2−
250 kv. ...	40	1	nil	8	5	26
1000 kv. ...	10	nil	nil	2	8	nil

1± = Increase or decrease of between 500 and 1000 cells
2± = Increase or decrease of more than 2000 cells

TABLE 6—EFFECT OF RADIATION ON EOSINOPHILS

	No. of patients	Effect of radiation on eosinophils				
		Increase		No change	Decrease	
		1+	2+		1−	2−
250 kv. ...	40	5	4	17	4	10
1000 kv. ...	10	1	nil	3	5	1

1± = Increase or decrease of between 200 and 500 cells
2± = Increase or decrease of more than 400 cells

DISCUSSION

The radiosensitivity of haemopoietic tissue and its consequent effects have attracted considerable attention. Peripheral blood changes depend for the most part upon the radiosensitivity of the precursor cells—their ability to recover from injury and the life span or rate of utilisation of the mature elements in the blood. The site of action appears to be mainly in the blood-forming organs. The mechanism of action of radiation on haemopoietic tissue is not definitely known. The haemopoietic tissue may be influenced in a direct or indirect way. The alteration of lymphoid tissue in the areas distant from the site of radiation is an example of the indirect type of action (Barnes and Furth, 1943).

Blood exposed *in vitro* to moderate dosage of radiation shows slight changes. A direct cytocidal effect on lymphocytes from the thymus and spleen has been observed in the test tube with as little as 50 r which may contribute to the early decrease in circulatory lymphocytes. Mature granulocytes, on the other hand, are quite resistant and are not affected directly by radiation except in excessive dosage. Haemolysis has been seen in blood subjected to heavy irradiation.

Radiation anaemia may be due in part to a haemolytic reaction as suggested by rapid decline of red blood cells, which in excess of that which results solely from the absence of erythrogenesis—the active phagocytosis of erythrocytes and the increased excretion of bile pigments (Davis *et al*, 1949). These facts do not in any sense constitute definite proof of a direct action of radiation on the mature erythrocytes. The early anaemia may be partially explained by the loss of red cells from circulation by increase in blood volume and to some extent by failure of replacement.

Knott and Watt (1929) carried out experimental work to observe *in vitro* the effect of deep roentgen therapy upon living white blood cells. They found that the phagocytic test is of definite clinical value. The loss of phagocytic power of irradiated white blood cells explains the well-known fact that actively septic patients do poorly when irradiated.

It is known that x-rays depress the three elements of the haemopoietic system, viz., erythrocytes, thrombocytes and leucocytes, when sufficient dose is applied—this phenomenon depends upon the dose rate, the skin dose and integral dose and the kind of tissue irradiated. Bush (1943) reported the quantitative relationship between the lymphocyte count and integral dose during treatment to the head and neck. Price (1948) made a similar study in patients receiving irradiation to the pelvis. The rate of fall in the lymphocyte count differed considerably in the two series.

"The results of Phillips do not harmonise with those of other investigators. In his studies the white blood cells were not materially altered in any way, a leukopenia did not occur and the effect of radiation was not definitely the production of lymphopenia. He concludes that there are no characteristic changes produced in blood picture by large doses of irradiation and the blood count should not lower the amount of irradiation, that it considered necessary to give".

Goodfellow (1936) made a study on 61 cases who had received radium therapy for malignant disease. According to him, lymphopenia was proportional to dosage. He believes that at least four to six weeks is required for the resumption of the normal blood picture.

In this investigation we have studied completely 50 cases, out of which 40 cases were irradiated from 200/300 kv. (potential). Attempts were made to direct our study on the effect of radiation part by part: head and neck, thorax and pelvis.

The results of our investigation are in agreement with the conclusion of Simpson (1933) and other workers.

40 patients were irradiated by 200/250 kv. It was noted that in Cases 11, 25, 26 and 27 there was a fall of haemoglobin values in the post-radiation period when compared with the pre-radiation values.

10 patients were irradiated by one million-volt. In Cases 1 and 5 of this series, similar fall of haemoglobin values was detected, when compared with the preradiation values. Patients with low preradiation values of haemoglobin, i.e., Cases 10, 17 and 19 in our series, with 200/250 kv. showed rise of haemoglobin values in the post-radiation period. With million-volt similar change was noted in Case 8. Patients with high initial haemoglobin values did not show marked change on either side.

Table 4 shows the effect of radiation on neutrophils. It is found that irradiation tends to lower the number of neutrophils in the circulating blood. In 11 cases there was definite fall in count and in 32 cases the leucocyte count did not show appreciable change.

As shown in Table 5 the majority of patients had a normal lymphocyte count prior to radiation. From the table we find that there is definite depression in 39 cases. 10 cases showed no change and in only one case there was slight rise in count.

The effect of radiation on the eosinophils was apparently a slight decrease in count (20 cases). 20 cases showed no change and in 10 cases there was slight rise (Table 6).

In general the effect of radiation on the leucocytes was to produce a reduction in number. Different types of leucocytes were not equally affected. Lymphopenia was most prominent. Next in order were changes in the neutrophils and eosinophils.

With regard to the part of the body irradiated and its reaction on the leucocytes, we find that 84 per cent of the cases having the disease in the pelvic area and 75 per cent of the cases with the disease in the head and neck region, showed lymphopenia when exposed to the 200/250 kv. machine. When similar part of the body, e.g., head and neck region, was irradiated by one million-volt machine 60 per cent of the cases showed lymphopenia.

We are not in agreement with the results of Phillips (*loc. cit.*). In our series there was a distinct reduction in the lymphocyte count during the period of irradiation.

Summary

Fifty cases were completely investigated. The effect of radiation on the haemogram by 1000 kv. and 200/250 kv. machines was studied in 10 and 40 cases respectively.

The effect of radiation on the neutrophils by the 200/250 kv. machine was decrease in count in 8 cases, no change in 27 cases and slight increase in 5 cases. By the 1000 kv. machine there was decrease in 3 cases, no change in 5 cases and slight increase in 2 cases.

The effect of radiation by the 200/250 kv. machine on lymphocytes was moderate decrease in 31 cases, increase in 1 case and no change in 8 cases. By the 1000 kv. machine, there was decrease in 8 cases and no change in 2 cases. There was distinct reduction of lymphocyte count during the period of irradiation contrary to the observation of Phillips who observed no reduction.

By the 200/250 kv. machine there was decrease in the number of eosinophils in 14 cases, no change in 17 cases and a rise in 9 cases.

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VAGINAL CANDIDIASIS IN OBSTETRICS AND GYNAECOLOGY

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Vaginal discharge, whether a primary or secondary symptom, is a very common complaint encountered in obstetric and gynaecological practice. Among the numerous causes of this symptom are the two pathogens *Trichomonas vaginalis* and *Candida albicans*. These two pathogens would account for a large number of cases of leucorrhoea. Until a few years ago *Trichomonas vaginalis* was said to be the commonest pathogen giving rise to distressing vaginal discharge. Of late, there has been a tendency to give a more important place to infection with *Candida albicans*.

The primary aim of this study was to gain information as to the incidence of *Candida albicans* infection in both pregnant and non-pregnant women, the symptoms caused by this pathogen and to evaluate the place of 'mycostatin' in the treatment of this condition.

Methods and Material

292 pregnant women in varying stages of pregnancy and 288 non-pregnant women selected at random form the basis of the study. Each patient was interrogated closely regarding her symptoms, special attention being paid to the type, quality and quantity of the vaginal discharge. A careful history also was taken and a thorough general and pelvic examination made. In all cases the urine was also examined for sugar and presence of infection. Cases where pelvic examination revealed gross lesions like cancer or polypi in the lower genital tract were excluded from this study. With aseptic precautions smears were taken from the vagina and cheesy material so obtained inoculated into a tube of Nickerson's medium. With Ayer's spatula the material was taken for a wet smear. In the absence of any cheesy material in the vagina and vulva, secretions from the rugae of the lateral vaginal walls or at the mucocutaneous junction were obtained. The inoculated tubes were incubated at 28°-37°C. for 1-5 days and examined for the presence of growths. Nickerson's medium being specific for candida other bacteriological examinations were not considered necessary. The incubated media can be kept at room temperature also but the observation period then is usually prolonged (2-7 days), whereas if placed in an incubator, results are obtained in 24-48 hours. Positive cultures are easily recognised as black or dark brown shining hemispherical colonies in the medium. With continued incubation filamentation is revealed. Hanging drop preparations, wet smears to which a drop of 10 per cent KOH solution was added to dissolve the epithelial cells, and smears stained with Gram's stain were also studied.

We have divided our patients into two categories, (*i*) symptomatic and (*ii*) asymptomatic. When a patient presented herself with symptoms of vaginal discharge, pruritus or any other such leading symptom and on investigation she was proved to have candida infection by culture she was labelled symptomatic. Where the patient had no symptoms in the form of any abnormal vaginal discharge or pruritus but culture was positive for candida she was labelled asymptomatic. The symptomatic group was again divided into two categories, viz., those with severe symptoms, i.e., vaginal discharge or pruritus or both were very distressing and was the main presenting symptom. She was termed mildly symptomatic when such history of vaginal discharge/pruritus could be obtained only on continued questioning.

Observations and Results

In this series of 580 cases, 201 patients gave a positive culture for *Candida albicans*, giving an over-all incidence of 34·5 per cent.

Age group—The youngest patient was 15 years and the oldest was 42. The maximum number of cases occurred between 20 and 30 years.

Parity—74·6 per cent of positive cultures was among the multiparous group. There were three unmarried girls aged 15, 16 and 19 years respectively.

Table 1 gives the incidence in pregnant and non-pregnant women.

There is an increased incidence of candida infection among pregnant patients. In the pregnant group with candida infection 27·3 per cent were in the first trimester, 43·4 per cent and 51·8 per cent were in the second and third trimesters respectively.

TABLE 1—SHOWING INCIDENCE IN PREGNANT AND NON-PREGNANT WOMEN

Category	Total No. of cases	No. of positive cases	Percentage
Pregnant ...	292	119	40·8
Non-pregnant ...	288	82	28·5

TABLE 2—SHOWING INCIDENCE IN PERCENTAGE OF MONILIAL, TRICHOMONAL AND COMBINED INFECTIONS IN THE WHOLE SERIES

Category	Total No. of cases	Candida alone	Trichomonas alone	Combined infection
Pregnant ...	292	99	31	20
Non-pregnant ...	288	66	43	16

TABLE 3—SHOWING RELATION BETWEEN SYMPTOMS AND THE TRIMESTERS

Group	1st trimester (per cent)	2nd trimester (per cent)	3rd trimester (per cent)
Symptomatic ...	70·4	40·2	31·3
Asymptomatic ...	29·6	59·8	68·7

TABLE 4—SHOWING INCIDENCE IN PERCENTAGE OF MONILIAL, TRICHOMONAL AND COMBINED INFECTIONS

Category	Candida	Trichomonas	Combination of both
Pregnant (122) ...	33·6	13·1	12·3
Non-pregnant (204)	24·2	19·1	6·4

Table 2 gives the incidence of monilial, trichomonal and combined infections in the whole series.

Symptoms—Not all patients in either group were symptomatic. There were 47·1 per cent cases in the symptomatic and 52·9 per cent cases in the asymptomatic group in the pregnant and 75·6 per cent symptomatic and 24·4 per cent asymptomatic in the non-pregnant patients.

Table 3 gives the incidence of symptomatic and asymptomatic cases in the different trimesters of pregnancy.

It is observed that there is a preponderance of the symptomatic group in the non-pregnant category of patients. While in the pregnant group 52·9 per cent were asymptomatic.

Table 4 shows the percentage incidence of monilial, trichomonal and combined infections among this group of pregnant and non-pregnant patients complaining of leucorrhoea and other allied symptoms—122 among the 292 pregnant women and 204 among 288 non-pregnant women.

The incidence of various clinical features is shown in Table 5.

It will be seen that in the symptomatic group, vaginal discharge mild or profuse is the most common symptom. Pruritus is next in order of frequency. Clinical manifestations of vulvitis, vaginitis and vulvovaginitis are seen in a fair percentage of cases. Once again attention is invited to the predominance of all symptoms in the non-pregnant group as compared to the pregnant.

Table 6 shows the degree of intensity of symptoms among the 56 pregnant symptomatics and 62 non-pregnant symptomatics.

Attention is again drawn to the larger incidence of severe symptoms in the non-pregnant group. The degree of pruritus varied considerably in intensity and many patients reported periods of relief followed by exacerbation even without any treatment. Some stated that they had relief during periods. We observed that while the characteristic thick discharge was present in a majority of symptomatic patients, 20 per cent had only a thin watery discharge.

We determined the pH of the vagina in all cases. Except in those with trichomonas infection, the value lay between 4 and 5. In the presence of trichomonas it was between 6 and 8.

TABLE 5—SHOWING INCIDENCE OF CLINICAL FEATURES

Category	No. of cases	Vaginal discharge		Pruritus	Pruritus & discharge	Dysuria, pruritus & discharge	Vulvitis	Vaginitis	Vulvitis & vaginitis
		Slight	Profuse						
Pregnant ...	56	32	9	3	12	5	—	9	11
Non-pregnant ...	62	22	17	2	14	9	6	5	5

TABLE 6—SHOWING THE DEGREE OF INTENSITY OF SYMPTOMS

Category	Severe (per cent)	Mild (per cent)
Pregnant (56) ...	15·1	32
Non-pregnant (62) ...	57·3	18·3

In this series of 201 cases of candida infection there was one diabetic. She was not pregnant. Two patients gave a history of having been treated with antibiotics previously. In another case vaginal candidiasis was found in association with candida infection of the tongue. The organisms were cultured from the vaginal swab, swab from the tongue and also from the faeces.

Positive cultures were obtained from the mouths of 17 newborn babies who developed thrush in the neonatal period. The mothers of these babies had candida infection of the vagina as proved by culture but were completely asymptomatic. The question, therefore, arises whether asymptomatic candidiasis also should be treated during pregnancy.

TREATMENT

We have treated only symptomatic cases. Mycostatin vaginal tablets (each containing 100,000 units of mycostatin in lactose base) were used. The method of treatment was to insert one tablet into the vagina daily for 15 days. Check-up smears and swabs for culture were taken 3-4 days after cessation of treatment and 6-8 weeks later. So far 52 symptomatic ptients (25 pregnant and 27 non-pregnant) have been completely treated and followed up for varying periods of two to ten months. Of these, 7 patients required a second course, at the end of which they were completely cured. (Only one patient showed a re-infection after 3 months and she was treated again with another course of mycostatin). Among the patients who had a second course of treatment one was a diabetic. One had an extensive treatment with antibiotics and the other five were pregnant. In the majority of patients relief of symptoms was noticed in 3-4 days from start of treatment. We have used only local treatment. No untoward or side-effect was noticed.

DISCUSSION

Distressing vaginal discharge in the absence of any ulcerative lesion of the lower genital tract has very often been proved to be due to trichomonas infection as well as infection with *Candida albicans*. Of these two pathogens, for a long time trichomonas infection was deemed to be far more common. Lee and Keifer (1954) made reference to the increasing incidence of vaginal candidiasis. They stated that prior to the introduction of antibacterial antibiotics, general practitioners saw four cases of trichomoniasis for every one of monilial vaginitis whereas three cases of candida infection are now encountered for each one of trichomonal vaginitis. Pace and Schantz (1956) observed that the ratio of monilial to trichomonal vaginitis was about 7 to 1 in non-pregnant patients and 15 to 1 in pregnant patients. It has been suggested that with the increasing use of broad spectrum antibiotics the incidence of vaginal candidiasis is likely to increase.

There is great variation in reported incidence of candidiasis. In the pregnant patient with symptoms the reported incidence varies from 0·74 to as high as 66·7 per cent. Without symptoms in the same group it varies from 4 per cent to 38 per cent. Among the non-pregnant, an incidence varying from 15·4 per cent to 61 per cent is reported. It is generally said that about 10 per cent of the female population at large, harbour yeast-like organisms, majority of whom are asymptomatic.

In our series there is an increased incidence of infection in the pregnant women—40·8 per cent as against 28·5 per cent in the non-pregnant. But what is more striking is the greater incidence of asymptomatic cases in the pregnant group, viz., 52·9 per cent as against 24·4 per cent in the non-pregnant group. Contrary to the majority of opinion we find that severe symptoms are more common in the non-pregnant than in the pregnant group, viz., 57·3 per cent as against 15·1 per cent in the pregnant group. We also observe that in this small series the ratio of trichomoniasis to candidiasis is 1 :3·2 while in the non-pregnant it is 1 : 1·5.

Vaginal candidiasis has always posed a therapeutic problem. For long, gentian violet or any of its variants was the drug of choice. But it had its own drawbacks. Hazen and Brown (1950) reported the discovery of nystatin, an antifungal antibiotic, isolated from cultures of *Streptomyces noursei*. It is said to be both fungicidal and fungistatic. It has little or no action against Döderlein bacillus. The drug has low toxicity and no side-effects.

We have used this drug by local insertion into the vagina once a day for 15 days in the treatment of vaginal candidiasis. Our results have

been very satisfactory. Of the 52 treated and followed up completely so far, 45 were cured, symptomatically and culturally with one course while 7 required a second course.

We invite attention to the incidence of candida infection in the babies born of seventeen mothers who had vaginal candidiasis but were completely asymptomatic and hence not treated. It is for consideration whether asymptomatic candidiasis if diagnosed during pregnancy should be treated in order to prevent infection of the babies. Babies born of the mothers who had the infection treated in pregnancy did not develop the infection.

Summary

In a series of the 580 cases the incidence of vaginal candidiasis was 34·5 per cent. In 292 pregnant women its incidence was 40·8 per cent while in 288 non-pregnant women it was 28·5 per cent.

42·3 per cent of patients among 580 were asymptomatic.

The commonest symptoms were vaginal discharge of varying quantity and quality and pruritus.

We found contrary to expectations an increased incidence of the symptomatic group in the non-pregnant women. The ratio of trichomoniasis to candidiasis in this series was found to be 1 : 2·2 (in the pregnant 1 : 3·2 and in the non-pregnant 1 : 1·5).

Treatment with mycostatin, one tablet inserted daily into the vagina for 15 days, has given us very satisfactory results. 45 out of 52 cases were completely cured—symptomatic relief having been noticed in all cases within 3-4 days. 7 cases required a second course.

Acknowledgments

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DIAGNOSIS OF TUBERCULOUS LYMPH NODE PERFORATION INTO THE BRONCHIAL TREE

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Cervical lymph node tuberculosis with fistulae, opening and closing over months and years, has been observed by many. No doubt caseous hilar or bronchial lymph node tuberculosis also behaves similarly. Tubercle bacilli have places of refuge even in the immune man in the caseous foci where they may multiply and break through in abundance more or less suddenly producing a distinct clinical entity. Perforation of caseous lymph nodes into the bronchial tree is known to play a great part in the evolution of tuberculosis in children. However, Kraan and Muller (1950) reported lymph node perforations in adolescents and young adults after large-scale bronchoscopic examinations.

Most workers believe that tuberculous process in the lymph nodes is of no importance in the adult type of pulmonary tuberculosis. But Schwartz (1950a) after autopsy of more than 700 cases reported a large proportion of tuberculous lymph node perforations in the bronchial tree of adults suffering from pulmonary tuberculosis in all its stages. He opined, that periodic reactivation and perforation of caseous pulmonary lymph nodes are responsible in most cases for endogenous reinfection and for the spread of the process in chronic pulmonary tuberculosis of the adult. Some recent reports on bronchoscopic studies go in favour of the hypothesis put forward by Schwartz (1950b). They are those of Levi-Valenski *et al* (1951) from Algeria, Vaksvik (1952) from Norway, Meng (1955) from Switzerland and Tricoire (1955) from France.

An accurate and definite diagnosis of lymph node perforation in the bronchial tree of an adult would be of great importance because of the serious implications for the patient. An active perforation persisting after resection of a lung segment may be responsible for a re-activation of the whole diseased process. Therefore, careful bronchoscopic evaluation is very essential prior to any treatment.

Material and Methods

All proved cases of pulmonary tuberculosis admitted to Kasturba Tuberculosis Clinic & Hospital, Lucknow, between January 1957 and September 1959 were taken up for study. The present report comprises of 300 cases.

On admission, before subjecting the patient to a bronchoscopic examination, a careful history was taken with a detailed clinical examination followed by laboratory investigations which included sputum examination, E.S.R. estimation and a laryngoscopic examination. Every case was x-rayed and a P.A. view of the chest was taken. The cases were classified according to the recommendations of Indian Tuberculosis Association (1940) into the three stages depending on the extent of the parenchymal involvement.

Bronchoscopic examination was performed in all cases under local anaesthesia using 2 per cent xylocaine solution. The bronchotelescopes were used for a detailed and minute examination of the bronchial tree for the diagnosis of lymph node perforation into the bronchial tree. The presence of any of the following signs was looked for:

Pathognomonic signs—1. Broad irregular funnel-shaped openings in the bronchial wall, surrounded by and partially filled with coarse granulation tissue. 2. Furuncle-like elevation of the mucosa with a central umbilication with exudation of purulent material on pressure from the bronchoscope, the follow-up study showing healing of the lesion by scar formation.

Suggestive signs—1. Round circumscribed openings in the mucosa varying in size from a pinpoint to a diameter of 2-3 mm. 2. 'Mucosal scars' which may be funnel-shaped or star-like retractions. 3. Humps or callous prominences with local discolouration of the mucosa and/or isolated patches of anthracotic pigmentations.

All those cases where any of the signs described above were noticed, had the bronchoscopic examination repeated every 2 months.

Results

Incidence—All the patients investigated were between 18 and 50 years of age, the mean age being 24 years. Out of the total of 300 cases examined, 199 cases were males and 101 were females.

Laboratory findings—On admission the E.S.R. ranged from 6-110 mm. (average 40 mm.). The sputum was positive for A.F.B. in 174 cases (58 per cent) and negative in 126 cases (42 per cent).

Skiagram chest—The detailed radiological picture is represented in Table 1.

Table 1—Showing Details of the Radiological Pictures Obtained

Type/Extent of disease	No. of cases	Per cent
(a) Type of disease		
Exudative mainly ...	225	75
Productive mainly ...	39	13
Fibrotic	36	12
(b) Extent of disease		
Stage I	28	9·3
Stage II	77	25·6
Stage III	195	65

Bronchoscopic examination—In none of the cases studied was the true picture of lymph node perforation, described as a pathognomonic sign, found.

Of the suggestive signs 'mucosal holes' were seen in 36 cases and 'mucosal scars' in 5.

MUCOSAL HOLES:

Mucosal holes were found in 36 cases. Out of them in 24 cases a single hole was observed and in 10 cases two holes were found in the same bronchus. One case had three holes and another five holes. More than five holes were not observed in any of the cases studied. Thus in 36 cases a total of 52 holes was seen. The distribution of these 'mucosal holes' is shown in Table 2.

Table 2—Showing Distribution of the 'Mucosal Holes'

Anatomical site	No. of holes on right side	No. of holes on left side
Near upper lobe orifice ...	20	12
Main bronchus near carina ...	8	6
Near middle lobe orifice ...	2	1
Near lower lobe orifice ...	1	1

These holes were present near the bifurcation of the large main bronchus. The mucosal surface covering the holes was normal in the majority. In three patients the mucosa was congested and swollen. On pressure with the bronchoscope mucous secretion oozed out in 10 cases. Purulent secretion was not noticed in any of the cases.

The appearance of these openings did not change in the follow-up bronchoscopic examinations.

Biopsy—In only 6 cases with 'mucosal holes' on bronchoscopic examination was the biopsy done. The biopsy report was as follows:

(a) Infiltration of the submucous layer with a few lymphocytes; distended mucosal glands; submucosal oedema in one case.

(b) Definite tuberculous granulation tissue with giant cells (5 cases); dilated submucous glands—some greatly distended and showing the flattened epithelium.

Only one case, where the section was cut slightly obliquely and passed through the mucosal hole, demonstrated a dilated duct going down for some distance in the submucosa. The lower portion of the dilated duct was filled with debris.

MUCOSAL SCARS:

Mucosal scars seen in only five cases were situated at the orifice of the bronchus leading to the main parenchymal lesion. All these cases had far advanced parenchymal lesion. In one case enlarged lymph node was found in close contact with the bronchial wall at the site near the scar and in the remaining four cases the x-ray picture was that of an obstructive lesion. In none of these cases was there any evidence of endobronchial lesion to explain the obstructive type of lesion seen roentgenologically.

Biopsy was not done as it might re-establish the perforation.

Discussion

In the 300 cases studied we did not find bronchoscopic evidence of recent lymph node perforation in any case. 36 cases (12 per cent) were having evidence of abnormal opening (mucosal holes) in the bronchial mucosa. This incidence is higher as compared to that reported by Adler *et al* (1958) which was 8 per cent. We do not think that the finding of the mucosal holes is enough for the diagnosis of lymph node perforation, a view also held by Adler *et al* (*loc. cit.*) and Huizinga and Smelt (1949) who demonstrated these mucosal holes to be the opening of diseased excretory ducts from mucous glands situated deep below the bronchial mucosa, with the help of bronchographic studies.

In the present series in none of the 36 cases with mucosal holes was there any clinical or radiological evidence to suggest a recent lymph node perforation. The only plausible explanation for the appearance of these holes appears to be that advanced by Adler *et al* (*loc. cit.*) that under normal conditions the small openings of long narrow ducts from the mucous glands traversing different layers of the bronchial walls cannot be visualised. However, inflammatory processes involving the mucous glands may cause changes at the narrow neck of the ducts of the mucous glands which may result in local destruction followed by cystic dilatation of the glands, accumulation of mucous secretion in these sacs and finally perforation into the bronchial lumen. A higher percentage (12 per cent) of mucosal holes in the series under review appears to substantiate this hypothesis, since most of the cases with mucosal holes belonged to stage III with cavitary lesion where one expects large amounts of heavily infected sputum passing continuously through the bronchial tree. Under such circumstances inflammatory processes involving the mucous glands cannot be ruled out.

Duprez and Mampuys (1953) studied the topography of the mucosal glands and the occurrence of dilated glandular ducts by means of bronchial casts and of special preparations of the bronchial mucosa. They found that the openings of such ducts were most of the time situated near the bifurcation of the larger bronchi. In the present series the mucosal holes were actually seen near the bifurcation of the larger bronchi, the common sites were the orifices of the right and left upper lobe bronchus and the medial walls of the right and left main bronchi just beneath the carina. This lends support to the hypothesis of these openings being those of diseased excretory ducts from the mucous glands.

There was no change noticed in the holes on follow-up bronchoscopic examinations, and on pressure with the bronchoscope mucous secretion came out through these holes. These findings further favour the hypothesis of mucosal holes as being openings of the diseased excretory ducts from the mucous glands.

Thus there is enough evidence to conclude that mucosal holes do not represent lymph node perforations but are openings of dilated ducts from the mucous glands. Those workers who have reported a higher percentage of lymph node perforations into the bronchial tree of adults have included this finding as a positive evidence of lymph node perforation.

So one is left with the star-shaped and funnel-shaped retractions of the bronchial mucosa as possible remnants of a former lymph node perforation. It was observed in 5 cases in the present series. The mucosal scars were situated at the orifice of the bronchus leading to the main lesion, and the roentgenologic picture was typical of obstructive lesion, and in one case an enlarged lymph node was found in close contact with the bronchial wall. In these cases there was also no

evidence of endobronchial disease to account for the roentgenological picture. Thus there is enough evidence to regard that these scars represent the remnants of a former lymph node perforation. It is not possible to determine their time of occurrence.

As in none of the cases studied was any evidence of recent lymph node perforation found and as there is enough evidence to suggest that mucosal holes seen on bronchoscopic examination are diseased ducts from the mucous glands and should not be considered as evidence of a recent lymph node perforation, the present investigation does not provide enough evidence for the validity of Schwartz's (1950a) concept of reinfection tuberculosis in adults.

Summary

300 cases were studied to test the validity of Schwartz's concept of reinfection tuberculosis and to verify the higher incidence of recent lymph node perforations reported by some workers. The diagnosis of lymph node perforation into the bronchial tree by bronchoscopic examination has been discussed.

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PRACTITIONERS' SERIES

RADIOTHERAPY AND THE GENERAL PRACTITIONER

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Introduction

Radiotherapy means treatment by ionising radiations. This naturally leads to the question, what ionisation means. We know all elements are ultimately made of atoms. Each atom is made of a central heavy part called the nucleus and a lighter periphery. In the nucleus are positively charged particles called protons and neutral particles of the same mass called neutrons. In the periphery there are electrons which move round the nucleus as planets round the sun. As compared to protons or neutrons, the mass of the electron is insignificant. It has a charge however equal to that of the proton but is negative. An atom is neutral, so the number of electrons (−ve) is always equal to that of protons (+ve) in the same atom.

Atoms of different elements vary because of the varying number of protons and of course an equal number of electrons in them. If by an agent an electron is knocked out of an atom, it would naturally be split into a positive and a negative component. This process is called *ionisation*. The atom minus its negative ion, the electron becomes a positive ion. On the other hand if by some means we can increase or diminish the number of neutrons in the atom of an element, we get an *isotope* of the element. Some isotopes occur in nature, others are artificially made.

Without going into the details of how it is produced or about their properties, we can say that x-ray can ionise matter and therefore are ionising rays. Radium is a metallic element whose nucleus splits up spontaneously and in the process emits positively charged particles called alpha rays, negatively charged particles called beta rays and very penetrating rays allied to x-rays called gamma rays. As all these rays can ionise matter, radium can be taken as a source of ionising rays. Elements like radium which emit ionising radiation are called radioactive bodies. Many of the artificial isotopes are radioactive.

Commonly used Sources of Ionising Radiations used in Therapy

X-rays, radium and radioactive isotopes are all used in therapy. But which one is to be used and when, depends solely on practical convenience of the user. The vast majority of cases are successfully treated all over the world by the so-called deep x-ray. This is, x-ray generated at a voltage ranging between two and four hundred thousand volts. In certain special cases however, x-rays generated at a higher voltage (million volts) have certain advantages because of the high penetrating power of the beam, that is the bundle of rays. A beam coming from a cobalt bomb is also very penetrating and may be used in the same way. Betatrons, linear accelerators, etc., can produce very penetrating rays and are occasionally used for experimental studies in radiotherapy. We need not go into the construction or modus operandi of any of these apparatuses. There are other cases where very penetrating rays are avoided and here we use x-rays produced at a low voltage ranging between 45 and 60 thousand volts. This is popularly known as contact therapy.

Radium and certain radioactive isotopes can with advantage be used as a source of radiation inside the body, in or very close to a lesion.

Certain elements, e.g., phosphorus and iodine, are selectively absorbed in certain tissues like the reticulo-endothelial system and the thyroid glands respectively. Radioactive counterparts of phosphorus and iodine can be used for diseases of these specific tissues. No particular source of ionising rays is a panacea for all diseases whether benign or malignant. It is only a competent radiologist who can use the right source for the right case.

Modus Operandi and Radiation Dose

Röntgen's paper on the discovery and properties of x-ray appeared in December 1895. In January 1896, E. R. Grubbe in Chicago treated a cancer of the breast with x-rays without of course any knowledge of its mode of action, which unfortunately we still do not know exactly. Since we use the ionising properties of the rays in therapy, it is natural that we should standardise its dose in terms of ionisation. The dose in radiation is called 'r' (roentgen) and a unit dose is defined as that quantity of rays which passing through a cubic centimetre of air at normal temperature and pressure, produces ions of either sign (±) the total charge of which is one electrostatic unit of electricity.

It is now more or less accepted that the ultimate effect of ionising rays in tissues is chemical in nature. In any substance in a watery base as human tissue is, they produce H and OH ions. In a cell they affect the enzymes necessary for normal metabolism. Although the effect is more on the spot where ionisation is produced, yet the H and OH ions can travel in the blood-stream and work on cells at a distance. Lastly the intercelullar areas are also affected, the one noticeable effect being production of fibrosis. The effect is total and is assessed by clinical observation.

Treatment of Nonmalignant Diseases

Radiotherapy is used mainly for treatment of malignant conditions. But many nonmalignant conditions respond well and we should know the diseases that do. Claims of successful treatment by x-ray of even mitral stenosis and Paget's disease have been made. The list is long, but here we mention only a few diseases in which radiotherapy has established its worth. We should sound a note of warning that radiotherapy should never be used for benign conditions unless other methods have failed.

The one benign condition where radiotherapy has completely changed the prognosis is ankylosing spondylitis, a crippling and invalidating disease particularly affecting a young man. A small list of nonmalignant conditions that are often treated with radiotherapy is given in Table 1.

Table 1—Showing Non-malignant Conditions often Treated with Radiotherapy

Site of lesion	Condition
Skin	Naevus, keloid, papilloma, eczema, etc.
Head and neck ...	Chronic parotitis, tuberculous adenitis, enlarged tonsils and adenoids, actinomycosis
Chest wall	Chronic mastitis
Abdomen	Tabes mesenterica
Female genital tract ...	Functional haemorrhage, metropathica haemorrhagica, fibroids, endometriosis, pruritus vulvae, leukoplakia vulvae. Also for artificial sterilisation of the ovaries
Nervous system ...	Syringomyelia, postherpetic neuralgia
Endocrines	Hyperthyroidism, acromegaly, Cushing's syndrome, myasthenia gravis, enlarged thymus of children
Locomotor system ...	Osteoarthritis, ankylosing spondylitis

Treatment of Malignant Diseases

Despite researches all over the world, chemotherapy as yet has not attained much success in treatment of malignant diseases. For cancer of the prostate which cannot be eradicated by surgery, follicular hormones or substitutes hold the only hope. In chronic myeloid leukaemia, myleran—an alkylating drug—has held its own against radiotherapy. Antifolics and purines are good for temporary palliation only in some cases of lymphoma and reticulosis. A few observed facts are as follows:

1. That tissues can be damaged by radiation.

2. That vulnerability of a tissue to radiation depends on its histologic species and also to its rate of mitotic turnover. Thus a squamous cell is more radiosensitive than a muscle cell, and a lymphocyte more than a squamous cell. Desjardine classified the cells of the various body tissues, beginning with the most radiosensitive as follows.

(a) Lymphoid cells (lymphocytes in the spleen, lymph nodes, intestinal lymph follicles, circulating blood, bone marrow, thymus, tonsil) and other structures in which such cells may be present.

(b) Polymorphonuclear leucocytes and eosinophils in blood or tissues;

(c) Epithelial cells including (i) Basal epithelium of certain secretory glands including salivary glands, (ii) basal epithelium (spermatogonal cells) of the testes and follicular epithelium of the ovaries, (iii) basal epithelium of skin, mucous membrane, and certain organs such as the stomach and small intestine, and (iv) alveolar epithelium of the lungs and epithelium of bile ducts;

(*d*) Epithelium of tubules of kidney;

(*e*) Endothelial cells of blood vessels, pleura and peritoneum;

(*f*) Connective tissue cells;

(*g*) Muscle cells;

(*h*) Bone cells;

(*i*) Fat cells;

(*j*) Nerve cells;

3. Cancer cells, because of their more rapid mitotic turnover, are more sensitive than the healthy tissue around. Also a tumour growing from a sensitive tissue is more sentitive than one growing from a comparatively resistant tissue.

In majority of cases the treatment of malignant diseases is either by radiation or by surgical extirpation or by both in which case radiotherapy may precede or follow surgery. Generally speaking if the tumour is known to be of the sensitive variety, radiotherapy is first tried and if it fails, surgery may yet be possible. On the other hand, if it is of a resistant type, the possibility of surgical success is better but in case of failure radiation may be given. There are other cases which are equally amenable to surgical and radiotherapeutic treatment. The surgeon and the radiotherapeutist have to put their heads together and assess what method is to be adopted.

Good response to radiotherapy depends on a good general condition of the patient. Very old age, debility and anaemia are thus adverse factors. A good local blood supply further helps. Infection, particularly syphilis, affects adversely.

Treatment by radiotherapy aims at a selective lethal action on the malignant cells and not by necrobiosis by which all cells healthy or diseased are killed. Hence in cases amenable to both surgery and radiotherapy, the latter achieves better cosmetic result than cautery or surgical extirpation.

In cases too advanced for surgery, radiotherapy is still possible. In such cases, even if it may not completely control the disease, it may make a tumour smaller and then amenable to surgery. Or it may considerably palliate a patient's suffering as in a fungating and discharging breast lesion.

Statistical analysis has shown that best results by radiotherapeutic treatment have been achieved in cancers of the skin, lip, breast and uterus. About eighty per cent of the early cases are cured.

The Role of a General Practitioner in Radiotherapy

Treatment of malignant diseases by radiotherapy entails a few hazards local and general for the patient. It is better that the general practitioner as the patient's own doctor should be conversant with them, tell the patient beforehand of the possibility, yet prevail upon him to undergo the treatment for his benefit. In anticipation of radiation he should advise his patient extra nutrition, vitamins and anti-anemic principles if there is anaemia. Any local infection should be controlled by local wash or antiseptics and/or parenteral antibiotics as required. Diabetes and syphilis should be investigated into and, if detected, adequately treated. During treatment, particularly in large field radiations, patients develop a loss of appetite and nausea. These often respond to vitamin B complex supplemented by vitamins B_1 and C. Radiation sickness, as it is called, is more likely to occur in cases of radiation of the abdomen. It is necessary that the patient would avoid exposing the radiated skin to direct sun. Radiation reaction to skin comes in stages, as erythema, dry desquamation, moist desquamation and ulceration.

Two per cent gentian violet in aqueous solution may be applied once a day so long there is no oozing. If there is infection, an antibiotic ointment may be applied. The base of the ointment should preferably be lanoline rather than yellow or white paraffin which soddens the area. Dressings are better avoided except when going to bed. If the eyelids receive radiation, reactionary oozing may stick the lids. This is well prevented by a drop of sterile liquid paraffin into the eyes before retiring. In case of radiation of the mouth and throat, frequent gargles with isotonic alkaline saline solution is advised. Here as well as in case of growth of the oesophagus, bland semisolid or liquid nutritious diet is prescribed. Egg flips and soft wheat puddings are suitable. Radiation of the abdomen may produce enteritis which may be controlled by nonmetallic astringents along with carminatives. The patient should also be warned that there may be a late reaction of the skin even after the course of radiation is completed, or it may leave permanent sequelae like depigmentation and telangiectasis.

CASE NOTE

IDIOPATHIC DYSPROTEINAEMIA

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Introduction

Most physicians have encountered patients whose response to suitable antibiotics was far from satisfactory and whom they have thought to be having poor resistance to infection. Some of the known factors altering the responses of the host to the pathogenic organisms are, anatomical obstructions to hollow viscera, diminished blood supply, metabolic disturbances like scurvy, diabetes mellitus, cortisone therapy, and failure in function of the normal defensive mechanisms, as in neutropenia and agranulocytosis. An additional known cause of poor resistance and delayed healing of wounds is undoubtedly agammaglobulinaemia. There is an added fall in the fibrinogen, a protein factor essential for the coagulation of blood, resulting in prolonged bleeding. The introduction of paper electrophoresis has resulted in the reorientation of ideas, regarding the altered biochemical pattern of blood proteins and haemoglobin. The term 'dysproteinaemia' has been suggested to this syndrome, because of absence of multiple protein fractions, gammaglobulin and fibrinogen. The following case is one such.

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Case Report

A female, aged 22 years, complained of palpitation, fatigue and delayed healing of wounds and prolonged bleeding, for five years. Her childhood was uneventful, except probably for a few episodes of respiratory infections. She observed at the age of fifteen that an injury, at play, healed at the end of four months. She had a scald over the great toe four months ago, which healed recently. Even a small cut took a long time to heal. Her first child-birth last year was a breech presentation which necessitated an episiotomy. The episiotomy wound healed at the end of three to four months. The bleeding was profuse and the discharge continued for nearly three months. She had repeated respiratory infections and bouts of diarrhoea during the last two years, which responded to suitable antibiotics. Of late, she had noticed that even a mosquito bite resulted in oozing of blood.

On examination the patient was moderately nourished. Her pulse, respiration and blood pressure were normal. The mucosae were pale. The scars when examined had the appearance, consistency, transparency, and the fine wrinkle of 'tissue-paper'.

There was no hyperplasia of the lymphoid tissues—lymph glands and the spleen. The caecum and colon were tender.

Investigations—Quantitative estimation of blood proteins: Total proteins—5·2 g. per cent; albumin—3·4 g. per cent, globulin—1·8 g. per cent, fibrinogen—0·12 g. per cent.

Liver function tests: Thymol turbidity—3 units; van den Bergh—negative.

Paper electrophoresis showed serum gammaglobulin to be negligible and plasma fibrinogen lowered.

R.B.C. count—3·7 million per cmm.

Hb—65 per cent (9·3 g. per cent); bleeding time—2 minutes; clotting time—1 minute 50 seconds.

W.B.C. count—6,650 per c.mm with polymorphs 45 per cent, lymphocytes 50 per cent and eosinophils 5 per cent.

Capillary resistance test was negative.

Bone marrow showed no plasma cells.

Widal test before T.A.B. vaccination was positive 1/25. T.A.B. vaccine 0·5 c.c. was given on 22-2-59. Widal test after T.A.B. vaccination on 28-3-59 was positive 1/25.

Discussion

A history of repeated infections of the lung, intestines and sinuses and delayed healing of wounds together with the characteristic 'tissue-paper' scars are pathognomonic of agammaglobulinaemia. Prolonged bleeding is an added sign of altered protein pattern—lack of fibrinogen.

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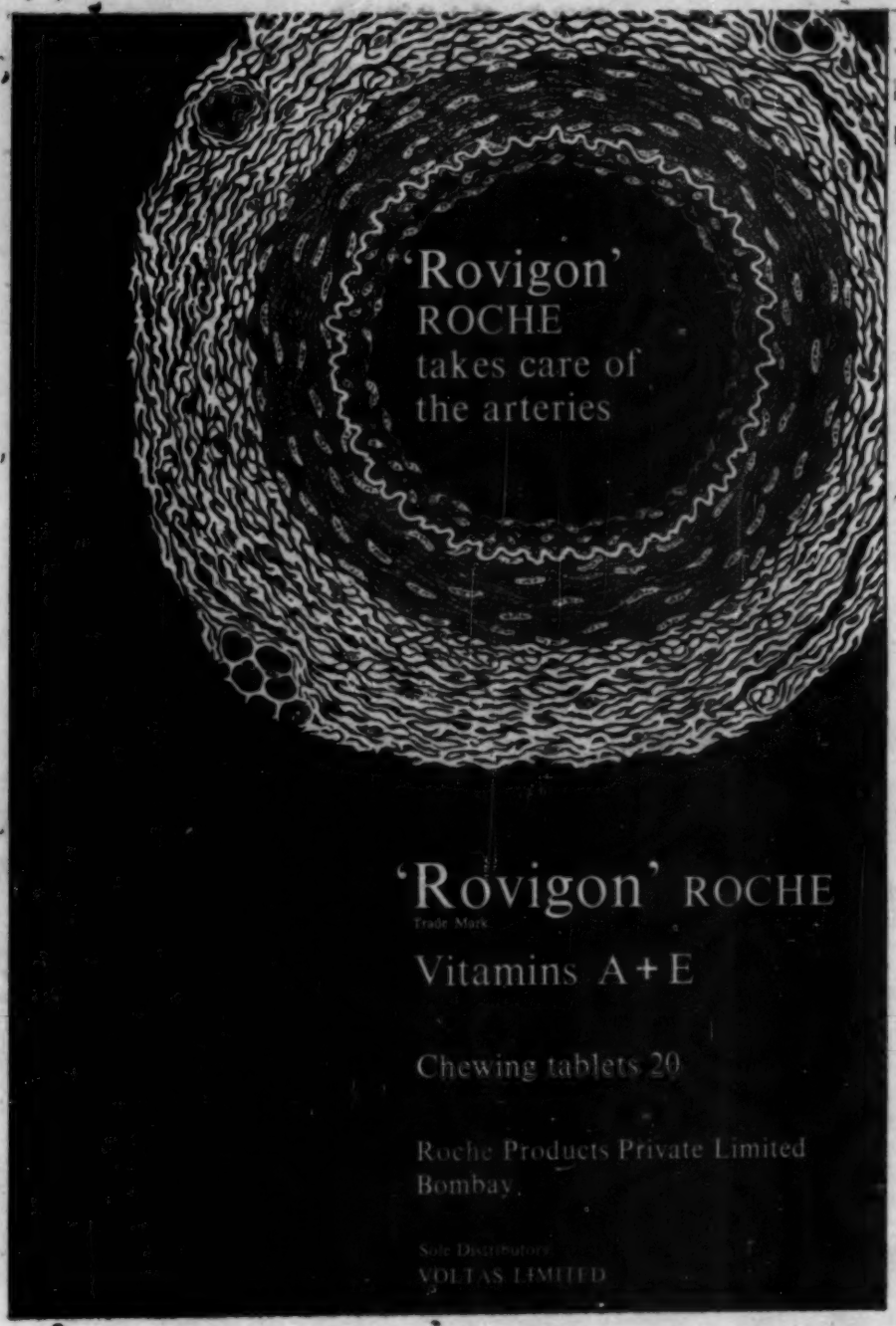
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These together led to the clinical diagnosis of 'dysproteinaemia', confirmed by the biochemical and other investigations.

The discovery of agammaglobulinaemia (Bruton, 1950) has been of special interest and importance to all interested in the problems of protein metabolism, immunity, antibody synthesis and the mechanism of healing of wounds.

The exact site of the origin of gammaglobulin is still debatable. There is experimental evidence favouring the lymphocytes and plasma cells. These two cells may be derived from a common stem cell which might be defective.

Fibrinogen is formed in the parenchymal cells of the liver.

A reduction in the specific blood protein may be due to diminished rate of formation or delivery to the circulating blood, or increased rate of utilisation, destruction or loss from the circulation or a combination of the factors.

In congenital agammaglobulinaemia there is no apparent underlying disease to explain the absence of gammaglobulin. The E.S.R. is low, and there are leucopenia with lymphopenia and a lack of plasma cells in the bone marrow smears. There are no antibodies for a variety of antigens and isohaemagglutinins are absent. Microscopic examination of the lymph nodes has shown absent germinal centres; less lymphocytes and a lack of plasma cells. The other mechanism seen in both sexes and in the adults is acquired through some sort of assault on the gammaglobulin-producing function.

In primary acquired agammaglobulinaemia there is some response to antigenic stimulation, the isohaemagglutinins are present to some extent and the gammaglobulin is not totally absent. There is often hyperplasia of the lymphoid tissues—lymph gland and spleen. Plasma cells are absent or a few are present. There is leucopenia which might be due to hypersplenism.

Certain well-known diseases, multiple myeloma and chronic lymphatic leukaemia produce a fall in the gammaglobulin content of blood. It is likely that the abnormal plasma cells in myeloma and the lymphocytes in leukaemia are not able to make normal gammaglobulin. Though there is a fall in the gammaglobulin, there is no increased susceptibility for infections. By far the commonest of the conditions giving rise to the diminished gammaglobulin is the nephrotic syndrome wherein there is loss of proteins in the urine. They usually present generalised oedema and more rarely history of infection.

The marked fall in the fibrinogen cannot be attributed to any of the known causes such as acute necrosis of the liver, recent delivery, cancer and dextran administration. Hence it has been suggested that the lower level may be due to defective synthesis, a constitutional defect of the liver cells. The clot formation is delayed, supple, retraction is slow and thus prolonged bleeding ensues.

The altered immunity mechanism in dysproteinaemia is of interest. The factors concerned in the resistance of individuals to infection are slowly defined. These factors localise the infection, destroy the pathogenic organisms, and repair the damage. The factors may be passive, as the complement and the properdin, or the actively formed antibodies, for which gammaglobulin is required.

The history of slow healing of wounds and the 'tissue-paper' scars suggests an added inherent defect in repair. This is due to the absence of the permeability factor which is thought to be a gammaglobulin fraction (Cameron 1956). The lymphoid hyperplasia observed is a result of agammaglobulinaemia and not the cause. Thus the recurrence, poor localisation, spread and persistence of infection and delayed healing, are due to deficiencies of multiple factors, which are often present combined in them.

Agammaglobulinaemic patients are susceptible to hypersensitive reactions and allergic phenomenon. Firlin *et al* (1956) reported the death of a patient after anticholera inoculation. The patient reported in this paper had severe reaction when 0·5 c.c. of T.A.B. vaccine was given.

The discussion of the lack of antibodies and recurrent infections in agammaglobulinaemia has prophylactic and therapeutic applications. The episodes can be prevented by monthly intramuscular injections of gammaglobulin in dose of 0·13 g. per kg. of body weight. During infections, a suitable antibiotic in adequate doses and gammaglobulin have to be given. During episodes of excessive bleeding, triple strength or quadruple strength plasma transfusion has to be given to arrest bleeding. Blood transfusion similarly arrests bleeding. One and half litres of blood roughly contains one gramme of fibrinogen.

It is hoped that the investigations performed on the agammaglobulinaemic patients will provide a better insight into the mechanism of antibody production and host resistance. As more and more electrophoretic analysis are included in clinical laboratory routines, it is probable that an increasing number of disturbances of the specific plasma proteins will be observed in the various clinical situations.

Summary

A case of 'idiopathic dysproteinaemia' in a female aged 22 years with repeated respiratory and enteric infections, delayed healing of wounds with the 'tissue-paper' scars and prolonged bleeding, has been reported.

The problem of agammaglobulinaemia in relation to the production of immunity and host resistance is discussed briefly.

Acknowledgments

I thank Dr. V. Srinivasan, Professor of Biochemistry and Dr. D. V. Ramamurthy, Professor of Bacteriology of the Madurai Medical College, for their assistance in carrying out the electrophoretic analysis of blood and the immunological tests, respectively. I thank Dr. K. Balasubrahmanian of the Meenakshi Clinic for his informative haemogram.

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PROTECTION THROUGH B.C.G. VACCINE

As a result of field sample studies our knowledge of tuberculosis frequency in India has been put on a firmer basis. The rates of "active" and "probably active" cases vary from 13 to 25 per thousand, those of bacteriologically positive ones from 2 to 8[1]. A preliminary forecast of the recently completed National Survey estimates that there are about 5 million cases of tuberculosis in India, of whom 1·5 million are infectious[2].

Under such circumstances it is clear that everything must be done to protect those not yet infected, and the best thing our Government ever did in the way of preventive medicine was to carry out a gigantic B.C.G. campaign in the teeth of tremendous opposition. By the end of 1958, 120·3 million cases had been tuberculin tested and 42·2 million vaccinated[1]. To spread doubt on the efficacy of this measure, as was done recently by Anderson *et al*[3], weakens the resolution of those who can maintain the vigour of such a mass campaign only if they are fully convinced of its efficacy themselves. Therefore, it is most fortunate that at this juncture the British Medical Research Council published the Second Report on "B.C.G. and vole bacillus vaccines in the prevention of tuberculosis in adolescents" [4, 5].

The Report covers 56,700 English schoolchildren, 14½ to 15 years of age. These volunteers have been vaccinated between September 1950 and December 1952. Only those who had a negative tuberculin test and a normal x-ray report were taken for the trial; they were divided at random into vaccinated and unvaccinated groups, the latter serving as control. Every effort was made to secure an almost complete follow-up and to detect every case of tuberculosis in both the groups. During 1957 and 1958 about 90 per cent of the whole trial groups have been contacted. At the slightest suspicion chest photographs were taken and doubtful cases submitted to experts who could not know to which group the particular case belonged.

The Report contains complete information about those who participated in the trial for 5 years with preliminary data covering a period upto 7½ years. During the 5-year period tuberculosis occurred in the B.C.G. vaccinated group in 0·38 per thousand, in the unvaccinated in 2·29 per thousand ; thus, B.C.G. vaccination reduced tuberculosis morbidity by 83 per cent. The same amount of protection was also found in those followed up for 7½ years. Protection was equally pronounced against pulmonary tuberculosis, which formed 70 per cent of all cases, as against pleurisy and glandular enlargement. Not only the number of tuberculosis cases was so much smaller amongst the vaccinated but also their severity seemed much less, and not a single case of miliary tuberculosis or tuberculous meningitis developed in the B.C.G. treated group. This trial was designed and executed under such strictly controlled conditions that there is no possible doubt left about the powerful protection that B.C.G. vaccine confers on adolescents for at least 5, and probably 6 years or more. B.C.G. vaccination should be given earlier than in this trial, probably before the age of 10. Whether it should be repeated at the expiry of the protected period depends on the age at which the first vaccination was actually applied, the most susceptible age range being 17 to 25.

An unsolved problem in India, but not confined to our country, is that of unspecific tuberculin sensitivity[6], which might make people ineligible for badly needed B.C.G. vaccination. Provided that our vaccine is as effective as the Danish liquid vaccine used in England, and there is no reason to doubt this, one is justified in saying that the most effective and, probably, in India the only effective way to protect an overwhelming majority of the population from the ravages of tuberculosis is to carry out B.C.G. vaccination in every tuberculin-negative individual.

[1] BENJAMIN, P. V.—Proc. 15th Tuberc. Conf., 1959, p. 9.
[2] SIKAND, B. K.—*Ibid*, p. 31.
[3] ANDERSON, A. S., *et al*—*Brit. M. J.*, **1** : 1423, 1959.
[4] *Ibid*, **2** : 379, 1959.
[5] Editorial—*Ibid*, **2** : 414, 1959.
[6] PRIMODT-MOLLER, J.—Proc. 15th Tuberc. Conf., 1959, p. 49.

CURRENT MEDICAL LITERATURE

Oral Penicillin G and Penicillin V

WEISS, W., NADEL, J., EISENBERG, G. M., AND FLIPPIN, H. F. (*Am. J. M. Sc.*, **237** : 204, 1959) from the Section of Infectious Diseases, Department of Medicine, the University of Pennsylvania, Philadelphia Pennsylvania, write :

It has been assumed that higher blood levels and acid-resistance justify the conclusion that penicillin V is better than penicillin G for oral therapy. This rationalisation is fallacious because : (1) oral penicillin G is effective therapy for penicillin-susceptible infections to the extent that penicillin V can do no better, (2) there is no controlled clinical evidence that penicillin V has any advantages over penicillin G, and, (3) penicillin V is no more effective and may be less effective than penicillin G in the treatment of infections of mice. Even for those who attribute clinical significance to the elevated blood levels of penicillin V, it should be noted that not all investigators are agreed that penicillin blood levels are significantly higher for V than for G, and the higher blood levels of penicillin V may be nullified by the facts that some strains of bacteria require more penicillin V than penicillin G for inhibition and that penicillin V is bound by plasma protein and inactivated by animal tissue to a greater extent than is penicillin G.

Clinical Studies of Hydrochlorothiazide

VERTES, V. AND SOPHER, M. (*J. A. M. A.*, **170** : 1271, 1959) from the Endocrine and Metabolic Laboratory, Department of Medicine, Mount Sinai Hospital of Cleveland, from an analysis of the clinical studies (antihypertensive and metabolic effects) on hydrochlorothiazide observe :

Hydrochlorothiazide appears to be a potent diuretic as well as antihypertensive agent. Its main action is to produce sodium and chloride diuresis. Ten patients with essential hypertension and one with congestive heart failure were given 50 mg. of hydrochlorothiazide three times a day. The 10 experienced a fall in blood pressure, and the patient with oedema had diuresis. The drug was well tolerated by all, and no major toxic effects were noted. Patients were discharged after one week of therapy in the hospital and examined weekly thereafter in the outpatient department. Perhaps the best way to regulate blood pressure in essential hypertension is to admit the patient to the hospital, place him on a no-sodium diet for several days, and then give a general diet along with a sodium diuretic agent.

Corticosteroid Therapy in Rheumatoid Arthritis

NEUSTADT, D. H. (*J. A. M. A.*, **170** : 1253, 1959) from the Arthritis Clinic and Department of Medicine, School of Medicine, University of Louisville, Ky., from a comparative study of effect of prednisone and/or prednisolone, methylprednisolone, triamcinolone, and dexamethasone in rheumatoid arthritis observes :

Twenty-five of these patients received each agent under study on separate occasions for periods of sufficient duration to warrant comparative analysis. Forty of the patients did not receive a trial with each preparation and data compiled from this group are included for purposes of evaluation of undesirable effects and dosage requirements. Clinical trials with dexamethasone were carried out in 40 patients for periods up to six months to allow preliminary assessment of therapeutic response, side-effects, and dosage schedules.

Comparable antirheumatic benefit was obtained with all compounds under study in the majority of patients. Appreciable differences in therapeutic benefit were noted in some patients, but no preparation demonstrated consistent superior therapeutic advantage.

On a weight basis, milligram per milligram, dexamethasone was the most potent steroid, with an average maintenance dose of 1·4 mg. The average maintenance dose of methylprednisolone was essentially the same as that of triamcinolone. Prednisone and prednisolone were the least potent, with an average maintenance dose of 11·4 mg.

The factor that chiefly limits the value of prolonged steroid therapy in rheumatoid arthritis is the frequency and severity of undesirable side-effects. The incidence of minor physiological effects of hypercortisonism (moon facies, hirsutism, acne) was comparable in all the corticoids under study. The occurrence of peptic ulcer and gastrointestinal symptoms without evidence of ulceration was similar with all compounds. Emotional disturbances, glycosuria, and oedema occurred in a significantly higher incidence during prednisone and prednisolone administration. Ecchymosis and/or purpura was observed in 36 per cent of patients receiving methylprednisolone, 23·6 per cent of patients receiving triamcinolone, and in only 14 per cent of patients receiving prednisolone therapy. No "new" adverse reactions resulted from use of methylprednisolone. Certain undesirable features, including hot flashes, erythema of the face, and increased perspiration, were found almost exclusively during triamcinolone therapy. However, the major untoward effect attributed to this hormone was muscle weakness, sometimes associated with marked weight loss. These side-effects resulting from triamcinolone usually subsided after patients were transferred to another steroid. Preliminary observations suggest that the frequency of side-effects occurring during dexamethasone administration is similar to that of the older steroids. Dexamethasone has a remarkable appetite-stimulating effect. Excessive appetite associated with striking weight gain occurred in the majority of patients.

A combination of two different steroidal agents (dexamethasone and triamcinolone) was employed in a small number of patients without significant success.

Severe Hypoglycaemic Shock after Chlorpropamide

COATES, J. R. AND ROBBINS, J. J. (*J.A.M.A.*, **170** : 941, 1959) of U.S. Naval Hospital, St. Albans, N.Y. report that an 88-year-old woman patient had received 250 mg. of chlorpropamide daily for two weeks as a substitute for insulin therapy. When the blood sugar level was found to be 220 mg. per cent, the dosage was increased to 250 mg. twice daily. After one day, the patient was hospitalised in coma but was released from the emer-

gency room after apparent complete recovery. On the next morning, she was again hospitalised in deep coma and the blood sugar level was 31 mg. per cent. The next morning it was 8 mg. per cent. Dramatic recovery was brought about by intravenous administration of dextrose and supplementary feedings. It would appear mandatory that patients receiving chlorpropamide be kept under close clinical observation, with frequent blood sugar level determinations.

Vancomycin in Severe Staphylococcal Infections

DUTTON, A. A. C. AND ELMES, P. C. (*Brit. M. J.*, 1 : 1144, 1959) from the Departments of Bacteriology and Medicine, Post Graduate Medical School of London, Hammersmith, in giving a report on the treatment by intravenous injection of vancomycin in nine patients with severe staphylococcal infections observe :

Of these, only three had normal renal function. The infecting strains of *Staph. pyogenes* were all resistant to several antibiotics, and treatment with other antibiotics had failed. Vancomycin therapy led to a good clinical response. Two of the patients died when vancomycin was withdrawn before the infection was controlled. Two others recovered from the staphylococcal infection but died subsequently of *Ps. pyocyanea* septicaemia.

Although vancomycin is bactericidal *in vitro*, three of the five surviving patients continued to harbour the infecting staphylococcus in lesions.

The danger of drug deafness in uraemic patients is stressed. This may occur during or after treatment. Several uraemic patients developed toxic deafness on dosage of 1-2 g. daily, although none received more than 13 g. in the course. A regime of lower doses controlled by "rapid" serum assays is outlined, and was used successfully in the management of an uraemic patient with staphylococcal pneumonia. The total amount given was only 5·125 g. over 11 days.

Thrombophlebitis occurred in some patients when vancomycin was given by simple intravenous injection in 10 ml. of saline, but not when it was administered in 250-ml. infusions over a 30-minute period or in larger volumes in saline or 5 per cent glucose transfusions.

The drug must be given intravenously, and as it is also toxic to the eighth nerve it is likely to be used mainly in hospital for severe staphylococcal infections, especially where this organism is resistant to several other antibiotics or where other chemotherapy is otherwise unavailing. It is also valuable when a bactericidal drug is particularly desirable—that is, staphylococcal infections in patients whose normal defence mechanisms are defective.

Cochlear and Vestibular Symptoms of the Cervical Rib Syndrome

PFLATZ, C. R. AND RICHTER, H. R. (*Arch. Ohr.-Nas.-Kehlk.-Heilk*, 172 : 519, 1958, Ref. *German M. Monthly*, 4 : 179, 1959) of Univ. HNO-Klinik and Neurolog. Univ.-Poliklinik, Basel, Switzerland) write :

The history and clinical and radiological signs of 85 cases of cervical rib syndrome were studied. In none of the patients could the symptoms be ascribed exclusively to this condition. The cochlear, vestibular and neurological symptoms ranged from purely subjective complaints to fully-developed Wallenberg syndrome. The manifestations are attributed to circulatory disturbances in the areas supplied by the vertebral artery, as the result of angiospastic attacks, asymmetrical development of the vertebral arteries, arteriosclerosis, endoarteritis and deformation or malformation of the cervical vertebrae.

Hydrocortisone Production in Late Pregnancy

COPE, C. L. AND BLACK, E. (*J. Obst. & Gynaec. Brit. Emp.*, 66 : 404, 1959) from the Postgraduate Medical School of London, London, write :

The daily production of hydrocortisone from the adrenal cortex has been measured by a method employing radioactive hydrocortisone.

Eight subjects in the last month of normal pregnancy have been compared with eight non-pregnant women of similar age range.

Hydrocortisone production in late pregnancy ranges between 20 and 40 mg. daily with a mean of about 25 mg. The production in non-pregnant women ranges between 5 and 23 mg. with a mean of 11 mg. daily.

The hydrocortisone production in late pregnancy is increased to from 2 to 2½ times the non-pregnant figure (Author's Summary).

Active Tuberculosis Complicated by Pregnancy

FLANAGAN, P. AND HENSLER, N. M. (*J. A. M. A.*, 170 : 783, 1959) from the Pulmonary Disease Service, U.S.A.F. Hospital, Parks Air Force Base, California, from the analysis of the course of a group of 22 pregnant women having active tuberculosis compared with that in a group of 40 non-pregnant women of the same average age (23 years) observe :

The two groups were also similar in regard to the status of the disease. The progress of each patient was assessed in terms of rates of stabilisation of the disease, of conversion of sputum and gastric washings, and of cavity closure. No significant difference between the two groups was discernible by any of these three criteria. There was no evidence that pregnancy affected the prognosis of tuberculosis provided the disease was treated the same in the pregnant as in the non-pregnant woman. The treatment consisted of certain combinations of isoniazide, streptomycin, and para-aminosalicylic acid. The obstetric results in the pregnant group were excellent; 21 had full-term, normal deliveries of healthy babies.

Intravenous Use of Pitocin for Induction of Labour

CLYMAN, M., PAKTER, J., JACOBZINER, H. AND GREENSTEIN, F. (*J. A. M. A.*, 169 : 1173, 1959) of New York from an analysis made of the use of intravenously given oxytocin (Pitocin) in New York City for 1955-1956, as ascertained by birth and foetal death certificates and by questionnaire observe :

Oxytocin was used for induction in 4·8 per cent of all live births, as determined from certificate data. Induc-

tion of labour with intravenously given oxytocin occurred primarily on the private services of the voluntary hospitals. Of all elective inductions, 95·1 per cent occurred on private services. Labour was induced by use of oxytocin almost five times more frequently in the private patients than in the ward patients.

A geographical variation was noted in the frequency of use of oxytocin for the induction of labour. Of the five boroughs in New York City, Brooklyn was recorded as having the highest incidence. A marked seasonal variation in the use of oxytocin was observed on the private services. The peak months were July, August, and December. Elective induction was chiefly responsible for the seasonal variation observed. No such variation occurred on the ward services.

Of the 1,025 premature infants born after the use of oxytocin, 281 (27·4 per cent) were born after elective induction. The highest incidence of premature births after elective induction occurred in June, July, August, and December. The infant mortality rate was almost twice as high for infants delivered by caesarean section where oxytocin had been previously used as compared with those delivered by caesarean section where previous induction had not been attempted. In several cases of puerperal mortality oxytocin appeared to have initiated an unfortunate sequence leading to rupture of the uterus, hypofibrinogenaemia, and uterine haemorrhage.

Induction of Labour

MATHIE, J. G. AND DOWSON, B. H. (*Brit. M. J.*, **1**: 1162, 1959) from the Department of Obstetrics & Gynaecology, Postgraduate Medical School of London, Hammersmith give below the summary of their observation on a tocographic study of the effect of castor oil, soap enema and hot bath on the pregnant human uterus at term:

75 women, all between the 38th and 41st weeks of normal pregnancy, were divided into five equal groups. The first group received the full ritual of 2½ oz. (71 ml.) castor oil, followed by a soap enema and a hot bath (the "O.B.H."). The second group had only the castor oil, the third only the enema, the fourth only the hot bath, and the fifth had no treatment. From tocographic records taken before and after the respective treatments, the "index of contractile work done by the uterus per hour" was determined before and after treatment, and the percentage difference was calculated, the untreated group acting as a control.

The authors calculated that the full O.B.H. increased the contractile work done by the uterus by an average of 264 per cent. The administration of castor oil alone effected an increase of 186 per cent, of enema alone 95 per cent, and of hot bath alone an insignificant 6 per cent. They conclude that castor oil and a soap enema probably act synergistically to produce the full effect of the traditional O.B.H., the hot bath playing little or no part. They claim, therefore, that the marked increase in uterine action produced by the O.B.H. justifies its retention in obstetric practice as a method of inducing labour or as a prelude to other induction procedures.

Erythroblastosis Foetalis

DICQUE, J. C. A. AND WRENCH, D. L. (*J. Obst. & Gynaec. Brit. Emp.*, **66**: 251, 1959) of Brisbane Hospitals in presenting an analysis of all cases of erythroblastosis foetalis treated between 1949 and 1956 in the Brisbane Women's Hospital and Brisbane Child Hospital observe:

It is shown that there is a sudden rise in infant mortality when the maternal anti Rh antibody titre reaches a critical level. The use of this level as a criterion for early induction of labour has resulted in a substantial reduction in both the stillbirth and neonatal death rates.

Consideration of the foregoing suggests that the treatment of erythroblastosis foetalis should be conducted along the following lines:

1. The blood group and the type of each expectant mother should be determined.

2. If found to be Rh negative, serial antibody tests should be carried out, e.g., at 12, 28, 32, 36, 38 weeks of pregnancy.

3. Those found to have an antibody titre which is well below the dangerous level as determined in each laboratory should be allowed to go to term.

4. In those cases where a high (dangerous) maternal antibody titre is found, early induction should be carried out. An antibody titre of 1/32 is an indication for induction, provided the infant is viable.

5. When the infant is born, it should be examined and its blood group, cord haemoglobin, cord serum protein (and, if possible cord serum bilirubin as well) should be ascertained and finally the direct Coombs reaction should be determined. An erythroblast count is of interest, but it is of little prognostic significance.

6. If the maternal antibiodies are known to have been at a low titre prior to delivery (0-¼) the infant may be left alone, even if found to be Rh positive with a positive direct Coombs reaction. Such infants would, in all probability, have a high cord haemoglobin value. These infants should be examined at two- to three-weekly intervals and treated by simple transfusion if they become anaemic and do not respond to iron tonic.

7. If the infant is Rh positive Coombs positive and maternal anti Rh antibody titre is known to have been 1/8-1/16, the infant should be given an exchange transfusion at birth, preferably by the umbilical cord route, using one bottle of blood even if the cord haemoglobin is above 15 g.

8. If the maternal antibodies are known to have been at a dangerously high titre prior to the birth of an erythroblastotic infant, a complete 90 per cent exchange transfusion must be done.

9. If following exchange transfusion, the infant manifests signs of kernicterus, such as severe jaundice, head retraction, irritability or convulsions, vomiting, hyperpyrexia, or if the serum bilirubin level is found to be above 15 mg. per cent a second exchange transfusion should be done and if the symptoms do not abate it may be necessary to do a third exchange transfusion.

10. If a jaundiced Rh positive infant should be admitted to hospital within 5 days after birth with a haemoglobin of above 15 g. and positive direct Coombs test,

it is preferable to do an exchange transfusion rather than wait for the maternal antibody titre to be determined as this will cause unnecessary and dangerous delay.

11. Erythroblastotic infants admitted to hospital after 5 days from birth may be considered to have had a test period during which kernicterus did not develop and may be treated by repeated small injections of blood (10-12 ml./pound of body weight) for the treatment of anaemia.

12. Grossly anaemic infants would be best treated with a massive initial transfusion of concentrated red cell suspension, preferably administered by a cannula inserted into a saphenous vein.

All infants treated should be under a 3-month period of surveillance and should be transfused if the haemoglobin level cannot be maintained by haematinics.

13. For those infants destined to die *in utero* before the 30th week of pregnancy, there is at present no satisfactory form of treatment.

14. Erythroblastotic infants, in whom a blood factor other than the Rh (particularly the D antigen of the Rh group) is involved, may be treated along similar lines.

Eye as the Site of Leukaemic Infiltration of Childhood

RODENHOUSER, J. H. (*Klin. Mbl. Augenheilk*, **133**: 811, 1958, Ref. *German M. Monthly*, **4**: 181, 1959) of Augenklinik, Univ. Marburg writes:

Leukaemic infiltration of the eyelid, lacrimal gland, conjunctiva and orbit, including the 3rd and 4th nerves, is less frequent in leukaemia than lesions of the fundus. Iridocyclitis accompanied by hypopyon or more often by glaucoma is another comparatively rare feature, mainly found in chronic leukaemia. It was formerly very seldom encountered in childhood. Owing to the increased period of survival in cases treated with ACTH, cortisone and antimetabolites a number of cases of iridocyclitis of leukaemic origin have recently been reported in children. An 8-year old boy with acute myeloid leukaemia developed iridocyclitis 2 days before death. Histological examination revealed bacterial metastases. The possibility that the bacterial infection was superimposed on a primary leukaemic lesion is discussed.

Nephrotic Syndrome in Children

GHOSHAL, S. P. AND NAG CHAUDHURI, J. (*Indian J. Padiat.* **25**: 637, 1958) from an analysis of a study of 45 cases of nephrotic syndrome in children observe:

All patients had marked proteinuria, hypoalbuminaemia, hypercholesteraemia, oedema, and oliguria. Duration of the disease before admission to hospital varied from five days to seven years. The maximum incidence was seen in the second and third years of life. The preponderance of male patients in the second year was remarkable (10 of 11 such patients). Only 10 of the 45 came from fairly well-to-do families. A history of nephrosis in siblings was present in four. The mother of another child gave a history of nephritis in childhood.

History of allergic manifestations was present in three patients (asthma in one, urticaria in one, and eczema in one). Fifteen patients gave a history of fever and cough or cold immediately prior to the onset of oedema. Other diseases preceding oedema were jaundice in one, skin rash in one, and diarrhoea in one. In another oedema was noticed seven days after vaccination against smallpox. The onset of oedema was insidious in all but three patients who had oliguria. In most it appeared first on the eyelids, but in some it came first in the legs or genitalia, and in one attention was first attracted by swelling of the abdomen. Thirty-one had generalised oedema with ascites. Only one was free of oedema at the time of admission. Some children had gross ascites with pitting oedema of the abdominal wall and prominent veins, and a few had umbilical and inguinal hernias. The liver was palpable in 20. A history of haematuria at the onset could not be elicited in any case. The systolic blood pressure was below 120 mm. Hg in most. Only 5 of 40 had a persistent diastolic blood pressure above 90 mm. Hg. Remissions and exacerbations during the course of illness occurred in most patients without any apparent cause.

Diarrhoea was common and did not respond to treatment. The stools during this period revealed the presence of cysts of *Giardia intestinalis* in five patients while stool culture showed the growth of only *Escherichia coli* in the others. Infections of the respiratory tract were even more common and often were followed by an increase in oedema. Infections of the eyes, the skin of oedematous genitalia, and the inguinal region were frequent. Poliomyelitis complicated the disease in two patients, with haematemesis in one and pleural effusion in one. There was only one death, and it was due to cardiac failure. Tuberculin tests were made on 40 patients and gave a positive result in 10. Twenty-two had haemoglobin values of more than 12 g. per cent and 3 had values below 10 g. per cent. The sedimentation rate varied from 20 to 60 mm. per hour in 34 patients and was normal in 2. Throat cultures showed haemolytic streptococci in seven, staphylococci in three, and streptococcus viridans in the rest. Albuminuria was present in all. Red blood cells were persistently absent from the urine in 18 patients but they showed hyaline and granular casts at times. The rest had red blood cells and hyaline or granular casts. The total blood proteins varied from 2·85 to 7 g. per cent. Serum albumin was consistently low. The alpha-2-globulin fraction was greatly increased but the gamma globulin was low in all. The blood urea level was more than 40 mg. per cent in 13.

Infantile Cirrhosis of the Liver

MEHTA, J. B. AND VERMA, S. L. (*Indian J. Child Health*, **8**: 230, 1959) from the Paediatric Unit, Sawai Man Singh Hospital and Medical College, Jaipur give in the following lines the summary of their observations on a study of infantile cirrhosis of liver:

40 cases of infantile cirrhosis of the liver were studied, from the clinical aspect, biochemical investigations and liver biopsy histology. Liver biopsy was performed in 30 cases. The maximum age incidence was in the age-group 2-3 years. Familial incidence was not found. The majority were from the merchant class families. Dietetic history was unreliable. Ascites, jaundice, visible abdo-

minal veins were poor prognostic signs. Fever, leucocytosis and lymphadenopathy were found very commonly. All cases were moderately to severely anaemic. Plasma proteins were lowered in 80 per cent but A:G ratio was altered in only 57·5 per cent. This latter alteration was more common in the later stages. Clinical evaluation of the extent of the disease did not always tally with the histology particularly, in what was clinically thought to be early cirrhosis. Biochemical relation proved fruitless. The histology is discussed with respect to distortion of lobular pattern, cell damage, reticulo-endothelial hyperplasia, bile duct hyperplasia and unilobular or "biliary cirrhosis". Veno-occlusive disease was not observed.

Liver Palpability in Normal Infants and Children

VYAS, K. J. (*Indian J. Child Health*, 8 : 439, 1959) from the Children Hospital Sir Takhtasinghji Hospital, Bhavnagar, from an analysis of the study of 715 healthy infants and children regarding the normal liver palpability observes :

The overall normal palpability of liver in infants and children was found to be 21·67 per cent. The minimum palpability was found on the first day of life, being only 3·5 per cent, but this palpability quickly rose to 41 per cent from the second to the tenth day of life. The highest palpability (88·8 per cent) was noted in the age-group of 4-6 months. Taking the age group of 1 month to 1 year, the palpability was 71·7 per cent. The palpability after two years of age declined, being the least in 7-12 years group.

In the first 10 days of life, out of 7 premature infants, 3 had palpable livers; and out of 6 newborns with physiological jaundice, 4 had palpable livers.

The size of the liver palpable below the costal margin varied from 1½ to 9 cm. This figure of ours is distinctly high as compared to the one of McNicholl, whose study of the range of projection of the liver edge below the costal margin in midclavicular line showed it to be from 0·5 to 4 cm. The greatest number (60 cases) of children had liver palpability of 3 cm.

The liver palpability showed no definite relation to the nutritional or social status of the child.

The lower edge of the palpable liver was never as sharp and distinct as is found in pathological conditions of the liver. The edge in this study was always rounded.

The consistency of the liver in all cases was soft without any degree of firmness.

It seems, from this study, that an enlargement of liver with a sharp lower edge and some degree of firmness, more than 9 cm. below the costal margin, may be regarded with suspicion.

Further study of this kind from different parts of the country will be useful and will help determine the maximum limit of normal liver palpability as well as the percentage of such palpability in Indian infants and children.

The liver was found palpable in 155 children, the highest figure being in the age group of 4-6 months. The extent of palpability varied from 1½ to 9 cm., the commonest figure being 3 cm.

Chemotherapy for Whooping Cough

ARORO, V. D. (*Indian Child Health*, 8 : 105, 1959) of G. T. Hospital and Bombay Hospital, Bombay tried different combinations of isoniazid, prednisone, chloramphenicol, and tetracycline on 60 patients with whooping cough. The diagnosis was mainly clinical. The youngest child was 3 months and the oldest 10 years of age. The duration of paroxysmal cough was one to two weeks in 25 and two to three weeks in 35 patients. Smear and culture examination of nasopharyngeal swabs taken in 53 patients showed *Hemophilus pertussis* in 6. Isoniazid alone was given to 41 patients, 14 were treated with chloramphenicol and tetracycline, and 5 with isoniazid and prednisone; 14 patients were under one year of age and all responded to one form of therapy or another. Best results were obtained with the combination of isoniazid and prednisone. The five who failed to respond to a seven-day treatment with isoniazid responded to prednisone.

Isoniazid alone gave good results in 70·7 per cent as compared with 57 per cent of those treated with the combined antibiotics, although the relief of symptoms took longer to appear with isoniazid. Thus isoniazid seems to have a definite place in the treatment of whooping cough, and even the 12 therapeutic failures showed some improvement with this drug. Three patients did not respond to antibiotic therapy but gave a good response with isoniazid. The combination of prednisone and isoniazid proved even better, as the response appeared earlier. The response to the antibiotics was also fairly good although all the patients were in the paroxysmal stage, in which antibiotics are considered to be ineffective.

CURRENT TOPIC

PRESENT TRENDS IN MEDICAL EDUCATION IN THE UNITED KINGDOM

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SUMMARY

It is suggested that the Recommendations of the General Medical Council have in the past been so framed as to have led to a stereotyped curriculum and examinational system in most British Medical Schools. The most recent Recommendations[1], of which an outline is given, are designed to encourage, within a defined broad general framework, freedom and initiative on the part of individual Schools, and it is hoped that a number of educational experiments will emerge. The recent formation of an Association for the study of Medical Education reflects this attitude. Competition for places in British Medical Schools is still severe, and reference is made to the resulting difficulties of student selection and to certain investigations which are being made into this problem. The desirable educational background for entrants to Medical Schools is discussed. An indication is

given of the principal ways in which medical education and medical examinations in the United Kingdom at the present time are being increasingly felt to be unsatisfactory, and of the probable lines which reform is likely to follow.

Probably the most important feature of medical education in the United Kingdom at the present time is the thought that is being given to the educational process itself. As has been recently pointed out by Beauchamp[9], there is in Great Britain only one body that is responsible for the licensing of doctors, namely, the General Medical Council. Only those whose names appear on the "Register" kept by the Council may legally describe themselves as "registered medical practitioners", and it is, for all practical purposes, only by such practitioners that the profession of medicine—in either the general or the various specialist fields—is carried on. The Council has the right to prescribe minimum standards in relation to pre-medical education and to the medical curriculum, to carry out visitations of medical schools, and to send visitors or inspectors to report upon the nature and standard of examinations. (The words "visitor" and "inspector" are both in use, having a significance related to the gradual development of the General Medical Council's powers through a series of Parliamentary Acts since the original Medical Act of 1858; but the distinction is becoming blurred, and it is felt to be likely that, in the future, each Medical School will be visited by a small team who will report upon the School as a whole, the quality of its instruction and the sufficiency or otherwise of its examinations, rather than that the present practice be continued whereby a whole series of visitors or inspectors, one for each subject, descends upon the School at intervals over a period). Whatever the actual mechanism employed, however, the fact remains that, as stated, it is the General Medical Council that is responsible for the sufficiency of the education provided by each and every Medical School, and a mechanism is prescribed whereby, if in any case the Council were not satisfied that the education given in a School was such as to guarantee adequate competence in medicine, surgery, and midwifery, the qualification awarded by that School would legally cease to entitle its holder to be included in the "Register". Hence, although the advice published by the General Medical Council from time to time about the nature of the medical curriculum and the scope and conduct of examinations has never been described by the Council itself in terms stronger than those indicated by the word "Recommendations," and although Presidents of the Council have (at least in recent years) expressly disclaimed the intention of prescribing any uniform curriculum, or of doing anything beyond prescribing minimum standards below which medical education must not be allowed to fall, there has been a tendency (in practice as well as in colloquial speech) for medical schools to regard the Council's pronouncements as "Regulations." This tendency was encouraged by the fact that the "Recommendations" themselves were usually long, detailed, and precise, so that in fact a more or less strereotyped mode of instruction and of examination came to be the rule in nearly all British Medical Schools. It was, therefore, a welcome change—though not altogether an unexpected one, since the majority of the members of the General Medical Council are representatives of Medical Schools or diploma-granting bodies—when the most recently issued Recommendations of the Council[11] were found to be much less precise and detailed than had obtained previously, and to give educational bodies much more freedom of manoeuvre. It is indeed the hope of the Council that these bodies will indulge in educational experiment and that different methods may be devised whereby the same end-product may be arrived at—an individual adequately qualified not only to practise medicine, surgery, and midwifery at the time of his qualification, but so equipped intellectually as to be able to adapt himself to changing circumstances and to continue as a capable practitioner throughout his professional life.

It may be of interest to those in countries other than the United Kingdom to be informed briefly of what the present "Recommendations" of the General Medical Council are, but first, perhaps, a note is required as to the meaning in this country of the phrase "Licensing Body." By this is understood a body which grants degree, diploma, licence, or other authority to practise. The body may be one which both teaches and examines (e.g., a University possessing a Medical School) or a purely examining body (e.g., the Conjoint Board of the Royal College of Physicians of London and the Royal College of Surgeons of England). However, the degree, diploma, licence, etc., admits its holder to the "register" maintained by the General Medical Council only if, as a result of the various processes referred to above, the Council is in fact satisfied as to the "sufficiency" of the qualification in question. Thus, notwithstanding that the phrase "Licensing Bodies" is in frequent use in England—not least by the General Medical Council itself—the statement made at the beginning of this article is nevertheless true, that the Council is the sole body responsible for the licensing of doctors in Great Britain.

The Council recommends that, before admission to the medical course proper, a student should possess a certain standard of general education and also should have passed theoretical and practical examinations in physics, chemistry, and biology; but the precise standard in all these cases is a matter for determination by the Licensing Bodies.

As regards the professional curriculum itself, most of the former very detailed recommendations have been swept away, those that remain being essentially as follows:

The period of professional study should be one of not less than 5 academic years, and should include instruction in certain specified subjects—(1) Human Anatomy, Physiology and Biochemistry; (2) Medicine (including Child Health and Pediatrics, Social and Preventive Medicine, and Psychological Medicine) and Surgery; (3) Midwifery and Gynaecology; (4) Pathology and Bacteriology; (5) Pharmacology; (6) Legal and Professional Obligations of Registered Medical Practitioners, and Forensic Medicine. It is recommended that candidates be examined in the first five of these subjects, and that

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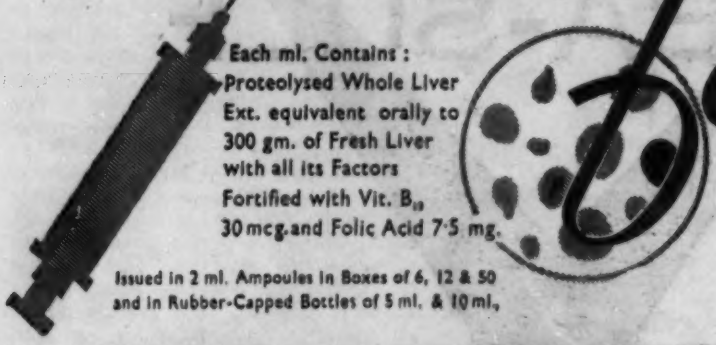

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While it is true that these essential recommendations are accompanied by certain "Notes" giving further guidance as to how the Council would expect the recommendations to be implemented, it is clear that the intention is, in fact, as stated above, that individual bodies should feel themselves free, within the general framework suggested, to experiment in relation both to teaching and to examinational methods, more especially as the Council emphasises that "the memorising and reproduction of factual data should not be allowed to interfere with the primary need for fostering the critical study of principles and the development of independent thought," and asks Licensing Bodies and Medical Schools specifically to consider their "policy with regard to courses of study and examinations and of the way in which it is proposed to realise that policy," with a view to reporting thereon to the Council at a later date.

The general atmosphere in British medical educational circles at the present time is, therefore, a forward-looking desire to remould a system which has become too stereotyped, too mechanical, and above all—because of a system of accretion without much selectivity—much too congested. It is realised that the student is, in general terms, labouring under much too great a burden of forced, and not very well coordinated, instruction, that he is so busy acquiring so-called facts that there is no time for any real educative process, and that, at the very least, a large-scale exercise in pruning, systematising, and co-ordinating is required, with, no doubt, also considerable change in educational techniques themselves. All this must seem very elementary in circles where such principles have been accepted for years. That is why we have thought it necessary to explain the general background of the British medical educational system and why it is only comparatively recently that experiment in education has, outside comparatively small limits, been thought of as possible. Nor has experiment yet, in general, passed beyond the stage of planning, or even perhaps of consideration, so that it is impossible to indicate in which directions the process may proceed in different places. All that can be done here is to indicate some of the problems being considered and what is, in general, being thought of by way of solution.

It may be noted in passing that, although systematic attention has been given in certain quarters over the last few years to problems of medical education—notably under the aegis of the Royal College of Physicians of London (Ellis[4]) but also in certain of the larger London Medical Schools and elsewhere—it is only within the last year that there has been formed in Great Britain an Association specifically for the Study of Medical Education, a body which recently[5] held its first Conference, to which it was fortunate in attracting not only participants from most British Schools but also distinguished medical educators from the United States and continental Europe. It is the hope of this Association that its members, both individually and collectively, may contribute toward the definition of problems to be studied and their resultant solution, and it was for this reason that the theme chosen for the first Conference was that of "Experiment in Medical Education." Such a development, together with the various interesting papers that have appeared within the last few years from individuals, or from groups working within individual Medical Schools, indicate the increasing development in England of that "awareness' of problems which has, over the last few years, occupied the minds of medical educators in the United States. Some of the reasons have always been indicated why such developments in England might have been expected to be relatively slower than in some other countries, but it should be said that the fact that they have occurred at all is in no small measure due to the accounts brought back to us and to the enthusiasm exhibited, and in turn further generated, by those of our colleagues who have in fact seen developments in other countries at first-hand.

Questions are often asked as to the numbers of applicants for places in British medical schools. Owing to the practice of most candidates of applying for a place in several different schools it is—for reasons which will not be surprising to those accustomed to dealing with inquiries of this nature—remarkably difficult to supply a definite answer to such an apparently simple question as what the numbers are, or whether they are at present increasing or decreasing year by year. It seems, however, to be the impression of most schools—apart, perhaps, from those with the most famous names, where lists always tend to be long—that pressure upon places has, in fact, tended to lessen over the last year or two. What is certain is that competition for places in dental schools has increased, and probably from among those who might otherwise have chosen to be doctors. Word seems to have spread abroad that the medical profession may be overcrowded, while on the other hand a good deal of publicity has been given to the present shortage of dentists. The increase in dental applications is of course welcome nationally in view of the shortage in the profession, but the bottleneck now is not (as it was a few years ago) a shortage of potential students, but shortage of places in which to train all those seeking to come forward. Even, if, further, sufficient accommodation could be made available, it is highly unlikely that teaching staff could be obtained in sufficient numbers in view of the competing financial claims of dental practice. The position in this regard is, in fact, a very serious one, such as can, possibly, be put right only by action at national level.

Among those who do apply for admission to Medical Schools (and, of course, the number is still, in most schools, much in excess of the number of places available), there naturally arises the problem of selection. It would not seem that this has been any more satisfactorily solved in England than elsewhere. The burden upon individual Deans could, of course, be lightened by the establisment of some central office to which all applicants would send in their names, at the same time indicating, in order, their preference for the various individual schools. The central organisation would then arrange, after discussion with the schools taking part

in the scheme, for such interviewing of candidates or other means of selection as might be decided upon, and would ultimately furnish each school with a list of those students who had been allotted to it. Such an idea keeps on being suggested by individuals, but has never achieved favour with medical schools as a whole. Each, therefore, struggles on as best it can, but in the unsatisfactory knowledge that (probably) it does not really know what it is trying to do. We presume that we are looking for "promise of developing into a good doctor," but, scarcely knowing how we would define "a good doctor," must feel even more doubtful about defining, and measuring, the qualities which give promise that a boy (or girl) may become one in future. A certain level of intelligence is obviously necessary, although other qualities may be at least as important in the actual practice of medicine—as, for instance, a high moral standard, willingness to sacrifice personal interest for that of others and power to take decisions and accept responsibility. It seems that a great deal more investigation is called for (if it is, in fact, possible) into what constitutes "a good doctor." Millar[1] suggested "job-analysis" in relation to doctoring. He felt that, though it would be a very large task, it could be done. Meredith[2] recently expressed the opposite opinion, and indeed it seems the general view that, so many types of career being comprised within medicine, and so complex and varied the characteristics that lead to its being practised well or ill, it would defy job-analysis in the ordinary sense, and that empirical studies are more likely to lead to useful results than are methods which at first sight would seem more rational. Among such seemingly rational methods are of course what may be grouped as "psychological methods of selection." There is obviously room here for really long-term experiments, checking data obtained by appropriate methods against the subsequent careers of the persons originally examined. It is disappointing that most experiments so far reported[3, 4] have given so little encouragement, but an interim publication is expected soon from the Nuffield Foundation. This will (one hopes) give the results of an experiment launched some 10 years ago, whereby in the earlier period an appropriate series of objective tests were applied to all (not only medical) students seeking entrance to certain selected Universities; further tests were carried out during the University career of all those accepted; and, in the later period, follow-up studies were made of these as well as of (as far as possible) those applicants who had not been successful in gaining admission. The intention is, of course, to investigate whether or not any correlation exists between the results obtained in the tests applied and "success" at the University and in after-life. The tests were designed to cover not only intelligence but also qualities falling within the domain of character, temperament, and personality. The possible value of such an investigation is obvious, since "intelligence tests" pure and simple can do little beyond enabling selectors, in relation to medical school admissions, to eliminate obviously unsuitable applicants, and thus make more time available for the consideration of those not so eliminated. In any case, as already remarked, a great deal more than intelligence goes to the making of a good doctor, or even of a good student. Determination, stability, adjustability to changing situations—all these may be far more important. And the investigation to which I have referred is designed to discover whether objective methods exist, or may be devised, to measure qualities such as these, and to find to what extent they correlate, or otherwise, with success in the chosen profession. The results of such an investigation should be of the greatest importance, particularly as it was strictly designed to be a test of tests, and in no way a test of students. Sheffield was one of the centres at which the investigation was conducted, and although the University authorities on their side furnished (under conditions designed to preserve the anonymity of the students concerned) certain information asked for by the investigators, they had no knowledge of what views the latter were forming in relation to any individual, and the investigation played no part in the University's own selection of students or in the subsequent treatment of those admitted.

It is possible that, as a result of the above investigations, or similar ones, information will become available which is practical and useful in the sense of indicating that there are objective and scientific methods which could justifiably replace, or at least supplement, the empirical and personal methods on which we are at present forced to rely in the selection of our students; or it may be information which points in precisely the reverse direction; or it may be indecisive. At any rate, it will be good to know. It is because we are at present fumbling so much in the dark that most of us (I imagine) feel our work in this sphere to be so unsatisfactory. In most cases, I suppose, we make use of an application form setting out the candidate's examinational achievements and his extra-curricular interests and activities, together with a head master's or headmistress's report, an attempt being made to synthesise all the available information following a personal interview with the applicant. It would certainly seem unwise, in respect of a vocational profession such as medicine, to dispense with the interview, and yet it is of course precisely over matters arising out of an interview that the opinions of different selectors may differ most sharply, or, even when all are agreed, that the opinion formed may turn out to be of the poorest prognostic significance. Gordon King[4] for instance, working in Hong Kong, found that only 20 per cent of those accorded the highest grading at interview survived to sit for the final examinations, as opposed to 70 per cent with the lowest grading. No student in the highest interview grade was among the first ten in the class by the time the clinical course had been reached, while four from the lowest grading, "including one double prize-winner," had risen to the upper level of the class. Similar findings were recently reported personally to the writer by a colleague in an English Provincial school. One had been apt to assume that, even with rather rough and ready methods, it was comparatively easy to sort out applicants into one group who clearly should be accepted, and another group who clearly should be rejected. As to the group in between, admittedly, probably just as good results could be secured by drawing names out of a hat; but the initial sorting into the

three groups was imagined to be a relatively simple matter. Even this easy assumption, however, appears to be relatively ill-founded. Fortunately, it is true that techniques of interview, especially group techniques derived from War Office Selection Board practice, are still the subject of intensive investigation, and it seems that the last word has not yet been spoken (at least one hopes it has not) in relation to student selection.

A related problem, and one which indeed constitutes a fact of the whole problem of student selection, is that of the type of educational background desired in potential entrants to medical schools. Here, two contradictory forces are at work—the idea, to which at least lip service is constantly paid, that the potential doctor should have a "broad cultural background" and the fact that in practice there is more and more pressure for "First M.B. exemption" to be obtained before a candidate's admission to the University. This latter tendency is more marked in England than in Scotland, where First M.B. work (i.e., chemistry, physics and biology) has up to now been commonly undertaken within the University, though ordinances have been promoted within the last year or two whereby, as in England, success in suitable school examinations may be regarded as exempting from the First M.B. examination, the student then entering directly upon the medical course proper (i.e., anatomy, physiology, and biochemistry). As stated, this has become increasingly standard practice in England, not only as a desideratum laid down by University Medical Schools themselves, but from the economic viewpoint. Parents paying for their children's education (a decreasing proportion year by year) are understandably anxious to escape if possible the additional burden of an extra session at the University, while the public bodies who (increasingly year by year) are responsible in greater or lesser degree for the payment of the fees and upkeep of University students are beginning to suggest that they will pay for a five-session course, but not for a six-session one. There is of course room for argument as to whether a "broad cultural background" is necessarily provided more adequately by the study of "arts" subjects than by "scientific" subjects properly taught, and there will doubtless always be boys and girls whose temperament and cast of thought are such that they are more adequately educated through study of "science" than by that of the arts as generally understood. For such, the mechanism of First M.B. exemption and direct entry to the medical course proper is highly suitable; and, indeed, considerable frustration may be experienced by pupils who, having received a school education of this pattern in England, then proceed to a Scotish medical school and have to do their "First Year" subjects all over again. Nevertheless, the pushing too far of "the First M.B. exemption" principle—with the result that the boy or girl intending to take up medicine often has, after the age of 15-16, virtually no instruction except in physics, chemistry, and biology—is something which many educationists have viewed as unsound, particularly in view of the value (as most of us would think) of a general cultural background in relation to the practice of medicine. (Reference may be made in this regard to a discussion held at the Royal Society of Medicine[2]. It is, therefore, of interest to note that, according to Hemingway[3], of the 2102 medical students admitted to the medical schools of Great Britain in 1957, 1456 (i.e. about two-thirds) entered First Year. The writer finds these figures somewhat surprising and assumes they must be a good deal influenced by the practice of the large Scottish Schools. Perhaps because of his own origin and University background, he views them with some satisfaction. It is of course true that, save for those exceptionally gifted academically, it is difficult to get through First M.B. work in one session in the University without some previous knowledge of at least chemistry and physics; but the writer's own preference would be, while retaining First M.B. exemption and direct entry to Second Year courses for a limited number of students of suitable temperament and attainments, for the normal practice to consist in First M.B. studies being carried out within the Universities, the school curriculum leading up to this being as broadly based as possible. It should contain some physics and chemistry, but only up to (say) the "Ordinary" level of the English General Certificate of Education; and provision should be made (in relation to University admission) for even this requirement to be dispensed with in the case of those whose academic performance in other subjects suggests such high ability that they can reasonably be expected to complete their First M.B. work in one session in spite of the handicap imposed by lack of any previous knowledge of the subjects in question. It seems a pity that the interesting scheme once envisaged by the University of London[4] was never launched. Under it (personal communication), First M.B. exemption on school work was to be abolished, and the subjects of chemistry, physics, biology, anatomy, and physiology were to be integrated into one eight-term course. Only a limited knowledge of chemistry and physics was to be required of entrants, who would, therefore, have had more time at school for "general" subjects.

The place of Botany in pre-medical education is rather an interesting one. Some (with whom the writer would range himself) hold that no student can be regarded as biologically literate unless his studies in biology have included at least a modicum of botanical ones; and most medical schools which still conduct a First M.B. course within the University include Botany as well as Zoology. Yet (for reasons which need not be gone into here) a position has stolen upon us, almost like a thief in the night, whereby, in respect to First M.B. exemption, a school pass at the appropriate level in Zoology (with no Botany) is becoming more widely acceptable than a pass at a corresponding level in Biology (i.e., a combination of Zoology and Botany). As stated, the reasons for this odd situation will not be gone into here, nor the further question of whether anything can, or should, be done about it.

Coming now to the medical curriculum proper, the main feature of the situation in this country at present is, as has already been indicated above more than once, an increasing awareness of something amiss; of the need, in making a clear diagnosis of the trouble, for a definite realisation of what it is that our educative process is in fact endeavouring to do, for devising means

that (so far as we can judge) seem capable of realising these endeavours, and for discovering criteria that will enable us to judge objectively the success or otherwise of the means devised. Analyses along these lines have been published by several writers[4, 10]; and by both of these, as well as others, in connection with the A.S.M.E. Conference, 1958, already referred to), and it is difficult for one familiar with their work to recapitulate the situation without risk of plagiarism. In general, it may be said that the curricula in most schools are recognised to be grossly overloaded, unbalanced, and as showing no clear evidence of policy or design, but rather only of having grown up by a process of relatively uncoordinated accretion, the whole being inspired by the underlying ideas of "comprehensiveness" and the production of a "safe" general practitioner. (Not that these ideas are necessarily bad; not, in fact, that they may not at one time have been good ideas; the suggestion is rather that, in our uncontrolled pursuit of them, we have landed ourselves in a situation where the means adopted are themselves destroying the ends in view). The examinational system is felt to exhibit the same types of defect; indeed, teaching methods and programme, on the one hand, and the arrangement and type of examinations, on the other, are thought so to react upon one another as to produce a vicious circle. The student's time is overburdened by the pursuit of factual knowledge; his examinations are designed to be a test of the amount of such knowledge acquired, rather than a test of real professional capacity, and are arranged in such a way as to appear to the student as a series of obstacles to be surmounted in turn and be forgotten; even his clinical work tends to be split up into a series of specialised and uncoordinated sections, so that the end-product tends to be an individual so accustomed to being crammed with factual knowledge, which he regurgitates at various examinational stages and then forgets, that he never has an opportunity of acquiring that basic scientific knowledge and those habits of reasoned and orderly thought which, in present-day conditions, are much more important than any attempt at a "comprehensive" education in the purely factual sense. (Especially since one is writing in an international journal, one should perhaps make clear that even under present-day conditions, some students do survive their ordeal relatively well, and that competent medical practitioners are still not unknown in Britain.').

Some diagnosis of the situation having been arrived at, what is the remedy? The answer is that it is just this which is now being made the subject of experiment.

There being universal agreement that the medical student has for long been carrying too heavy a burden, and in view of the fact that a year of post-qualification hospital experience is now compulsory, the view has naturally been expressed by some that the medical course might be reduced in length. This suggestion has, however, been rejected by the General Medical Council, whose Recommendations[11] still advise a 5-year course (5 years, that is, subsequent to passing the examinations in chemistry, physics, and biology). The Council was "impressed by the importance of ensuring that the practitioner of the future is adequately trained in the medical sciences, and thought it would be unwise to attempt to curtail the time spent on the study of these sciences and on the cultivation of scientific method." Equally importantly, in view of the criticisms of the present curricula set out above, the Council felt "that the primary task at the present time is to find means of reducing the congestion in the curriculum: to instruct less and to educate more." It felt that, were a shortening of the curriculum to be proposed at the present time, the reforms which it hopes for might be defeated at the outset; "congestion might well be preserved if not intensified, and the course would be liable to become still more vocational and less liberal."

Thus, for the present, the length of the course remains at 5 years, and each medical school is working out, within the much freer framework now allowed by the General Medical Council, how best to remould its course in order to overcome the defects depicted above. At this stage, it is of course impossible to say how many schemes may be produced, how (if at all, in major respects) they will differ, and how many will survive the tests of time and competition with other medical schools. The writer has not yet heard of anything being suggested as radical as the Western Reserve experiment; but, even so, quite reasonable reform may be looked for. Greater integration of anatomy and physiology is to be expected; lessening of the total time devoted to these subjects, although, in England as elsewhere, the topographical anatomist is apt not to yield ground readily; and increase, during the pre-clinical period, of the number of suitable clinical demonstrations illustrative of disordered structure and function. The Second M.B. Examination (anatomy, physiology, and biochemistry) is likely to retain its present position (after 5 terms' study of the subjects in question) and scope (except as modified by the remarks already made). Following an Introductory Clinical Course, designed still further to bridge the gap between anatomy and physiology on the one hand and clinical studies on the other, there will be 3 years of clinical work proper. It is likely, however, that in this period there will be, as compared with the past, fewer systematic lectures and didactic instruction in general, a simplification of the system of "appointments," clerkships, and dresserships into which clinical work is necessarily to some extent compartmentalised, and a greater adoption of the tutorial system, whereby a small group is "followed through" the different stages of the curriculum by a single tutor. It is hoped that these changes will, *inter alia*, help to get over some of the difficulties in the present system emphasised by Ellis[4]—that "teaching and care of patients can no longer always be adequately performed at the same time," that discussion and criticism have tended to be replaced by passive instruction, that an undergraduate has had less and less feeling of being a member of a team, and that clinical experience has tended to be fragmented rather than integrated. There is also intended to be a general lightening of the all-round burden during these years, and (at any rate in the writer's own school) the setting aside of two separate "elective periods," each of 2-3 months' duration, during which there should be no prescribed classes or clinical work, and in which the student will, after consultation with a Director of Clini-

cal Studies and others, undertake work of his own choosing. It is also the intention (again in the writer's own School) to recast the examination system subsequent to the Second M.B. Thus, instead of the Third/Fourth and Final M.B. Examinations, there will be Parts I, II, and III of the Final Examination, at the end, respectively, of the Fourth, Fifth, and Sixth Years (i.e., the 3rd 4th, and 5th years subsequent to passing, or being exempted from, the first M.B. Examination). Not only will this arrangement permit a more rational juxtaposition than obtains at present between time of study of a subject and time of examination in it; it is also intended that the different Parts shall be so related to one another as to permit something approaching a "progressive assessment" of each candidate, rather than to suggest a series of independent obstacles to be surmounted. In addition to the thought being given to the relationships of different examinathions to one another, the actual technique of examination is itself being studied. As Russell Brain pointed out at the A.S.M.E. Conference[1], the relationship between teaching and examination is a subtle one, and deserving of further study; while, as long as examinations are used at all as means of assessment of knowledge, progress, or intellectual capacity, investigations into the validity and reliability of different forms of examinations procedure must continue.

With this we bring to an end our survey of present trends in medical education in the United Kingdom. In a way it is a suitable time of talk of "trends," because, as we have sought to indicate, the present is essentially a period of growing uneasiness about existing methods and of a re-thinking in relation to our whole educational process. Whither the trends will lead us is a matter for the future.—*The Journal of Medical Education*, August 1959, Volume 34, No. 8, Pp. 785-794.

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NOTES AND NEWS

The World Medical Association

The German Medical Association, host of the XIV General Assembly of the World Medical Association, scheduled to convene in West Berlin, September 15-21, 1960, is planning to have an extensive Medical Film Programme. All medical associations are cordially invited to present to the German Medical Association their recommendations as to outstanding postgraduate medical teaching films, particularly those produced in their country, which should be given consideration by the Special Committee that has been appointed to select the films to be shown.

The World Medical Association Headquarters Secretariat is issuing a special "Film Recommendation Sheet" for the use of the member associations.

Nuffield Grants to India

Grants from Nuffield Foundation for scientific, medical and social projects throughout the Commonwealth passed the £1 million mark for the first time last year.

The Foundation gave £20,000 over three years to continue the experimental diploma course for teachers of English as a foreign language under the direction of Prof. C. S. Phandari to the Government Central Pedagogical Institute, Allahabad.

Another Foundation grant of £3,500 over three years was given to the Institute of Child Health in Calcutta for an investigation into the pattern of disease among the children living within a square mile around the Institute.

The report said: "India has one of the worst records of child health in the world. Children under the age of one year died (in 1953) at the rate of 115 in every 1,000 compared with 28 in every 1,000 in Britain and 20 in every 1,000 in Sweden."

International Meeting of Forensic Pathology

The II International Meeting of Forensic Pathology will be held on September 18-21, 1960 in New York City. The meeting will include the dedication of New York's new building for the office of the Chief Medical Examiner, City of New York. There will be six halfday scientific sessions and a scientific programme is being planned.

International Congress of Ophthalmology

The XIX International Congress of Ophthalmology will be held in Delhi on 3-7 December 1962. Capt. K. Sen of Calcutta has been elected as the president of the

Congress. This will be the first Congress to be held in Asia. There will be two main subjects and four symposia and about 50 free papers. Association for the Prevention of Blindness and the International Organisation against Trachoma will also hold meetings during the Congress. The two languages chosen by the International Council are English and French.

The Registration fees are: (i) For Members from the Ophthalmological Societies affiliated to the International Federation: 150 Indian Rupees; (ii) For Members from Non-Federated countries: 165 Indian Rupees; (iii) For Associated Members (wives and children accompanying the Members): 50 Indian Rupees; (iv) For Scientific Members: 50 Indian Rupees, without participation in Social functions.

All correspondence and requests for information should be sent to the Secretary-General, Dr. Y. K. C. Pandit, Bombay Mutual Buildings, Sir Pherozeshah Mehta Road, Bombay 1 (India).

All-Asian Congress of Paediatrics

The first All-Asian Congress of Paediatrics will be held in New Delhi on 2-6 January 1961. The Congress is sponsored by the Indian Paediatric Society and the Association of Paediatricians with the approval of the Government of India. The official languages of the Congress will be Chinese, English, Hindi, Japanese and Russian.

Registration of members must be notified on or before April 20, 1960.

Titles of papers, exhibits, films, etc., with an abstract of not more than 200 words should be sent to the Secretary General before April 30, 1960. Abstracts of the papers will be considered by the Scientific Programme Committee and the papers accepted for inclusion in the programme will be communicated to the participants by June 30, 1960. Delegation fee shall be paid in rupee, U.S. dollar or sterling and cheques drawn in the name of "First All-Asian Congress of Paediatrics" and crossed.

Membership forms and further information will be available on request from the Secretary General of the Congress, 95, Dilkhusa Street, Calcutta 17.

All-India Obstetrics & Gynaecological Congress

The XI All-India Obstetrics and Gynaecological Congress will be held in Calcutta on 23-25 January, 1961. The subjects for discussions are (1) Accidental Haemorrhage, (2) Diagnosis and Treatment of Early Cancer of Cervix, (3) Statistical: Stillbirth and General Cancer.

Detailed information from the Secretary of the Bengal Obstetrics and Gynaecology Society, CMC House, 91B, Chittaranjan Avenue, Calcutta 12.

Medical Equipment Developed by the Armed Forces Medical Services

The Armed Forces Medical Services have been successful in developing some very complicated medical equipment during the past one year or so.

The most important item designed and developed by the A.F.M.S. is a battery-operated electrocardiograph, a prototype of which has been made at its Medical Stores Depot in Poona for the first time in India. The entire machine has been fabricated by the technicians of the Depot, and with the exception of the galvanometer, electronic valves and minor components, the other parts have been produced by it from locally available material, thus making the instrument 80 per cent indigenous.

Very delicate and sensitive, the instrument in capable of taking all the leads which a modern cardiographist would like to take. It operates on two radio-batteries which are indigenously produced and easily procurable in all the leading towns of the country. It is completely self-contained and capable of taking a record almost anywhere.

A special feature of the machine is that it does not require any earth connection, normally needed for mains-operated models, and there is absolutely no fluctuation and outside disturbance. The record taken on the machine is completely free from alternating current interference and the base-line is quite steady—features which are difficult to find in the imported models. The record is taken on photographic paper—a system which is accepted as being more diagnostic. A special portable dark-room box and a small processing cylinder have been provided so that the record may be developed on the spot.

The machine is extremely sturdy and can stand much greater stress and strain than the various imported models. It has been specially designed to meet the requirements of the three Services in which sturdiness is an essential quality. The production cost of the prototype has worked out to Rs. 5,000 and compares favourably with any of the imported models costing as much as Rs. 8,000.

Among the other equipment developed by the A.F.M.S. are a tomographic attachment, a combined ultra-violet, infra-red and operation theatre lamp and a light and cautery apparatus.

Progress of Health Programmes

Mr. D. P. Karmarkar, Union Minister of Health, said that infantile mortality in the country had registered a fall from 160 to less than 100 per thousand. The general mortlity rate, which ranged between 20 and 25 per thousand in the last decade, had come down to 10 and 12 per thousand. The expectation of life had risen from 32 to 42.

These observations were made by the Minister in a talk in the series "Planning for Prosperity—Towards Better Health" broadcast from the New Delhi Station of All-India Radio on December 4.

Referring to the objectives of the national health programmes, the Minister said that the health schemes drawn up after independence were motivated by the concept of preventive approach. Prevention was not only better but far cheaper than cure. The results of such a programme were slow in coming, were not dramatic but were all the same more enduring.

In the matter of tuberculosis, the Minister said even if all the hospital beds in the country were set apart for tuberculosis patients, they would not be enough to treat 25 lakh cases. Efforts were, therefore, directed

more for prevention, early detection and cure and limiting the spread of infection rather than to institutional treatment. The number of beds for tuberculosis patients had increased in the last 10 years from 7,000 to nearly 25,000 but stress had been laid on preventive inoculation with B.C.G., extension of facilities for detection and treatment in early cases through tuberculosis clinics and domiciliary services, isolation of infective cases and physical and economic rehabilitation of the cured cases. Against the Second Plan target of 200 new T.B. clinics, upgrading of 100 existing clinics, establishment of 10 T.B. control and training centres, 400 beds for isolation and 8 rehabilitation work centres, there were in position 50 clinics, 3 training centres and 260 isolation beds.

In the Third Plan it was proposed to add 200 T.B. clinics, 5 training centres, 500 isolation beds, 7 rehabilitation work centres and 25 mobile T.B. clinics for rural areas. To produce the necessary workers for this programme, a National T.B. Institute had been established in Bangalore for training doctors, nurses, health visitors, social workers and technicians.

Under the B.C.G. programme, 13 crore persons had been tested and nearly 5 crores of the vulnerable population vaccinated. A scheme of treatment of patients in their homes with chemotherapeutic agents was also in hand.

As against 10 crore cases of malaria in a year some years ago, the number had already reduced to one-tenth. There were to be 390 mobile malaria units, each covering a population of one million, with the help of which an intensive antimalaria campaign was to be conducted in the next three years with the object of eradication of malaria. The Minister hoped that malaria would be virtually wiped out of the country in the next few years. A provision of about Rs. 58 crores would be made in the Third Five-Year Plan for this purpose.

Filariasis, another serious public health problem was being similarly dealt with through mass treatment campaign by mobile teams.

An appraisal of the situation regarding the prevalence of leprosy made it necessary to revise the traditional approach of inpatient treatment and it was decided to set up peripatetic teams in the areas showing high incidence. One team was provided for 50,000 to 60,000 of the population. The total number of 250 control units proposed to be set up by the end of the Third Plan would reach 2 million cases of leprosy estimated to be in existence. This would involve an expenditure of about Rs. 17 crores.

For smallpox, an eradication programme was being undertaken and it was hoped that with countrywide vaccination and re-vaccination to be carried out during the next three years this recurring scourge would be wiped out. An autonomous smallpox commission was being set up to give technical guidance and administer and execute the programme.

The Minister said that closely linked with the problem of communicable diseases was that of environmental sanitation. The National Water supply and Sanitation Programme held a key position in the Five-Year Health Plans. Nearly one-third of the total outlay on health in the Second Plan was earmarked for this programme. The programme was started in 1954 and a sum of Rs. 12 crores was set apart for urban and Rs. 6 crores for rural water supply schemes, 193 water supply and 57 drainage schemes were taken in hand. The Second Plan made a provision of Rs. 91 crores. 307 urban water supply and drainage schemes were under execution. Most of these were expected to be completed during the Second Plan. In the rural areas 228 schemes were in hand.

Another activity to benefit the rural population and emphasising the preventive approach pertained to the primary health centres and maternity child welfare centres. 2,000 primary health centres were expected to be in position by the end of the Second Plan period. Over 1,200 had already been opened. In the third Plan period the number would be increased so that each of the 5,00 National Extension Service Blocks had a centre.

Regarding curative facilities, Mr. Karmarkar said there were schemes for expansion and improvement of hospitals at district headquarters. Between 40,000 and 45,000 additional beds would have been added by the end of the Second Plan period. Along with a quantitative increase in the bed strength, the services provided had been supplemented by improved diagnostic and specialist facilities, and it was planned that within the course of this and the next Plan a network of well-developed regional and district public health laboratories should be in position throughout the country.

Referring to cancer, the Minister said that the Chittaranjan Cancer Research Institute at Calcutta, the Cancer Research Centre at Bombay, and the Tata Memorial Hospital were being wholly aided by Government.

The country according to the target, should have one doctor for every 5,000 persons, i.e., about 85,000 to 90,000 doctors. At the end of the First Plan there was 69,000 doctors and the number would be over 80,000 by the end of the Second Plan. There were today 55 medical colleges in the country, 10 of which were opened during the last four years.

The total admission capacity was now 5,000 per annum. Facilities for post-graduate medical education were also being developed in the All India Institute of Medical Sciences in New Delhi, and a dozen upgraded departments in selected medical colleges in various parts of the country. The Indian Council of Medical Research had forged ahead with its activities of promoting, guiding and coordinating research.

The training programmes for nursing had been stepped up to turn out 2,000 nurses every year and it was hoped that there would be 30,000 trained nurses by 1960-61. The Third Plan proposals aimed at training 20,000 to 25,000 nurses. The other para-medical personnel was also being trained to increasing numbers. A scheme for training 50,000 'dais' had been undertaken.

The population problem, the Minister said, was another matter occupying more and more the centre of the stage and their attention had naturally been given to it in increasing measure in recent years. Apart from the 1,800 rural and 500 urban family planning clinics

provided in the Second Plan, activities in this field had touched upon research, training, education and propaganda, testing of contraceptives, etc. "The growing awareness and the acceptance of the need for family planning encourages us to hope that the ambitious plans now being drawn will give the programme a complexion of a mass movement and will help in effectively tackling this very urgent problem."

Health Programmes' Objectives

Central broad objectives are understood to have been outlined for the health programmes to be undertaken during the Third Plan.

Among the schemes that will receive priority are control of communicable diseases, improvement of environmental sanitation and health conditions in villages, family planning and development of indigenous systems of medicine.

It is proposed to split the Third Plan's health schemes into two categories—Central schemes and State schemes. The Centre will give full financial assistance to the State schemes which are included in national programmes. Other State schemes will not receive subsidies from the Centre.

Among schemes included in national programmes are control of communicable disease, water supply, education and family planning. These will be financed entirely by the Centre.

The proposal to split the health schemes has been made for three main considerations: programmes which need special incentives should receive full Central assistance, there should be uniformity of action on the part of States and, lastly, the need to do away with matching grants, which have been held responsible for delays in implementing schemes.

In formulating priorities for the Third Plan, health experts are also understood to have indicated that larger allotments should be made for health schemes than in the past.

They have stressed that health funds should not be diverted to other spheres, that public health engineering organisations should be strengthened and that municipal bodies should be given incentives to undertake drainage work.

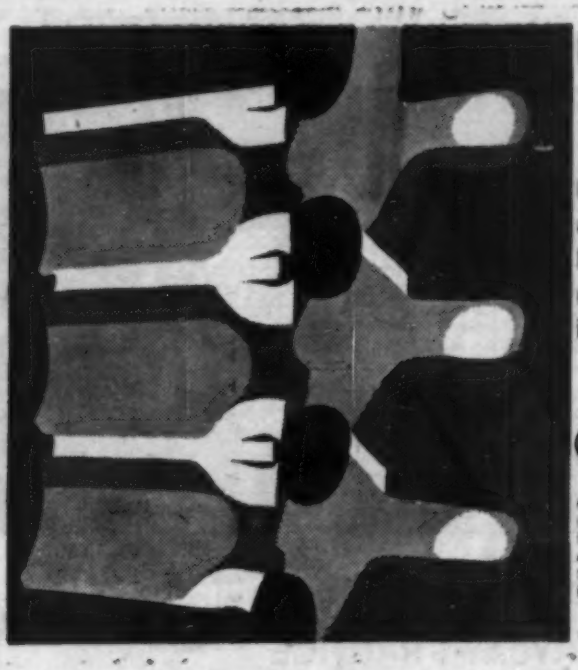
A New Broad Spectrum Antibiotic

A broad-spectrum antibiotic Ledermycin, dimethylchlortetracycline (DMCT) which is significantly more potent than tetracycline and active against more bacterial strains, has been recently described. Thirteen medical investigators reported on the new drug at the Seventh Annual Symposium on Antibiotics. Scientists from the University of Texas, Southwestern Medical School, reported DMCT was effective in laboratory studies against more of the bacterial strains commonly causing urinary tract diseases, than were previous tetracycline drugs. The Harvard study reported, DMCT remains in the blood much longer than tetracycline and 48 to 72 hours longer than either chlortetracycline or oxytetracycline. Drs. L. P. Garrod and Pamela Waterworth of St. Bartholomews Hospital, London, reported they found DMCT to be twice as active as tetracycline against six of a group of nine species of disease-causing bacteria, isolated from infected patients in studies involving 275 strains of the bacteria. In no case was the new drug less active than tetracycline they said. In the treatment of nine cases of Brucellosis (Undulant fever), Dr. Guillermo Chavez Max of Mexico City reported that all patients have been free of symptoms for two and one-half months following suppression of the disease by DMCT. Dr. Chavez said the new drug has the advantage over drugs of its same group, of being useful at lesser doses and better tolerated. Two physicians from the Norristown Pennsylvania State Hospital, attributed the drug's longer life as reported by Dr. Finland, to its slow rate of excretion. The Norristown investigators said DMCT tends to accumulate in patients' blood over a normal five day course of treatment and that the germ killing concentration of the drug in the blood on the fifth day of therapy, was twice as high as after the first day. They estimated the drug will circulate in the body 72 to 96 hours after dosage is discontinued. The new antibiotic was developed in the Lederle Laboratories of Cyanamid International.

REVIEWS

Evolution of Nervous Control from Primitive Organisms to Man—By Bernard B. Brodie and Allan D. Bass. American Association for the Advancement of Science, Washington, D.C., 1959; 6¼"×9¼", cloth, pp. vii+231, price $5.75.

This monograph is based on the symposium organised by the section on Medical Sciences of the above-mentioned Association. The study of the behaviour of the higher animals revolves round the activities of the nervous system. It is a protoplasmic control of the higher order, the active substances appear to be nucleoproteins. The polarised cell membranes are the origins of nervous function. Speed, versatility of response and modifiability of behaviour are the advantageous features of animals with nervous system. While the chemical transmitter acetylcholine and its esterase have been found in nearly all phyla of animals, ardenaline-noradrenaline has been demonstrated only in vertebrates. Various amino acid compounds may also act as transmitters. Cephalisation, i.e., the higher level of integration in the brain may be the result of the elaboration of sense organs on the head. The evolution of the nervous system took place on the basis of the primitive receptor-effector mechanism. Fig. 1 in page 44 depicts it in a simple and instructive way. The neurones of the hypothalamus and adrenal medulla present secretory actions. The flexibility of the central nervous system is due to excitatory as well as inhibitory synaptic activity. In the regulation of homeostatis the nervous system is concerned with rapid adjustment to changes in environment in contrast to the endocrine system which is responsible for slow and general adaptations. The two systems are linked at the hypothalamic



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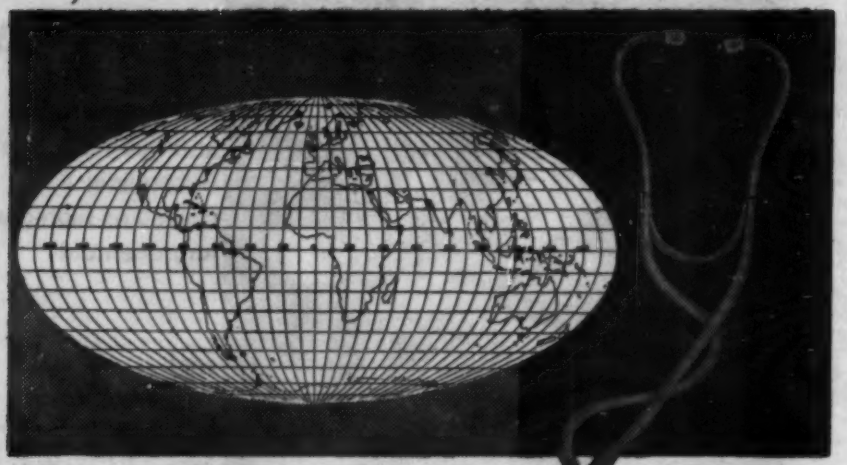

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level. Reflex excitation is associated with depolarisation and inhibition with hyperpolarisation of neuronal membranes. 5-hydroxytryptamine (5-HT, Serotonin) serves as a neurohumoral transmitter to hypothalamic centres. Reserpine acts by interfering with the finding of 5-HT at serotogenic nerve-endings. It releases the serotonin in the brain which serves as an intermediary for the tranquillising action of reserpine. Chlorpromazine produces adrenergic blockade at peripheral sites as well as at the hypothalamic level. γ-Aminobutyric acid (GABA) seems to play the role of a central inhibitory transmitter. The functional differences of the nervous and endocrine systems are more quantitative than qualitative. The hypothalamus contains many important neurohumoral chemical agents such as noradrenaline, serotonin, substance P, histamine, acetylcholine, adenosine triphosphate and vasopressin. Cases of phenylpyruvic oligophrenia are improved by restricting phenylalanine in the diet. Tryptophan is a precursor of nicotinamide, the deficiency of which causes the psychosis of pellagra associated with indicanuria. On experimental basis it has been found that men with frontal lobe lesions do not underscore in specific tests, the results of such lesions are nonspecific.

According to Freudian formulations all behaviour is activated by the physiological needs of the organism called the drives or instincts. Physiological needs are somehow transformed into thought and action. This may be due to the hypothetical 'innate releasing mechanisms' (IRMS). Animal experimentation corroborates Freudian hypothesis regarding the catastrophic influence of maternal deprivation in infancy in the development of the ego. The nonverbal communication of feelings and attitudes between men as well as between animals plays a vital role. Modern experimental research is verifying the biological and cultural factors in the genesis of human behaviour to which Freud drew our attention in the beginning of this century. This monograph has tried to bridge the gap between somatology and psychology. Though written by specialists representing a variety of disciplines there is no dichotomy or conflict in their viewpoints. It is a highly stimulating book particularly to students of physiology, pharmacology, neurology, psychology and psychiatry. The book is well-illustrated and there are pages of references at the end of each chapter.

Der Gesundheitszustand der Heimkehrer –Ergebnisse von Forschungsaufträgen des Bundesministeriums für Arbeit und Sozialordnung, Bearbeitet von dem Allgemeinen Krankenhaus St. Georg, Hamburg (Chefarzt: Prof. Dr. H. W. Bansi) und der Medizinischen Poliklinik der Johannes-Gutenburg-Universität, Mainz (Direktor: Prof. Dr. R. Duesberg). 1959. VIII, 91 Seiten, 11 Abbildungen und 36 Tabellen, Gr.-8°, (Georg Thieme Verlag, Stuttgart), kartoniert DM 12.80 (Arbeit und Gesundheit, Heft 66).

The Health Condition of Returned P.O.W.s. Results of Researches organised by the Federal Ministry of Labour and Social Order, carried out by the General Hospital, St. Georg, Hamburg (Chief Med Officer: Prof. Dr. med. H. W. Bansi) and the Medical Policlinic, J. Gutenberg-University, Mainz (Director: Prof. Dr. Duesberg), pp. 91, 11 illustr. (in German). Price DM 12.80.

In countries where an elaborate compensation system for war victims is in force and where a large number of citizens returned after years spent in P.O.W. camps, the question is of great practical importance whether the almost generally suffered 'prison dystrophy' has caused any permanent damage. To find reliable answers, the authorities responsible for public health and social security have entrusted hospitals and university clinics with research projects such as that under review. The first part of this report contains the results of internistic examinations for dystrophy sequelae in P.O.W.s returned to Germany, carried out in Hamburg (St. Georg Hospital). Altogether 677 people were examined; 518 had returned from Russian P.O.W. camps in 1948-50, while 159 were released in 1955-56. These figures represent 64·8 and 74·0 per cent respectively of the total of 1,015 homecomers who had been requested to appear for this follow-up examinations. Earlier investigations of this group had been published in this series some time ago. Now, everyone was subjected to a careful clinical examination, fluoroscopy and skiagram of the chest, E.C.G. at rest, standing and after exercise with the standard leads and special leads after Wilson and Nehb. Particular attention was focussed on the liver because among former P.O.W.s late liver damage was a frequent finding; therefore, 6 different liver function tests were carried out in every case. The results have been listed under the headings of general impression, cardiovascular, respiratory, liver and biliary, gastrointestinal, vegetative dystonia, social situation and general survey. The results show that there are much less late sequelae than previously expected. Only among those who returned in 1955-56 liver damages are conspicuously frequent, while among the much larger group who returned up to 1950 the frequency is not higher than among the general population, although they suffered the most severe degree of dystrophy from 1945 to 1947. Tuberculosis and vegetative dystonias are also fairly often seen while allergies, peptic ulcers and biliary calculi are rare. In considering the figures one has to remember that they are misleading inasmuch as of 100,000 taken prisoners at Stalingrad only 5,000 came home. It seems also that the former P.O.W.s aged earlier than the civilian population.

The second half of the book contains similar investigations carried out at the University Policlinic, Mainz, on 2,022 returned P.O.W.s as a continuous follow-up from 1942 to 1956. The results are similar to those of Hamburg with liver damages found in 112 cases or 5·5 per cent; of them 2·0 per cent show cirrhotic or precirrhotic changes and 2·7 per cent cholicystopathies. The other sequelae have been due to subacute bacterial endocarditis, amoebiasis or enterocolitis. Of all those who claimed damages only 20 per cent were recognised as due to war service or imprisonment. A follow-up by well trained hospital physicians of such a number of people over many years is of great importance to everybody interested in the natural history of disease in general and the late consequences of malnutrition, especially protein deficiency, the main cause of 'dystrophy', in particular.

OBITUARY

Dr. A. L. Walimbe

Dr. A. L. Walimbe was born on October 17, 1917 at Kumallia in Satara District. He passed his Intermediate Science examination from the Fergusson College. After obtaining his medical degree from the Grant Medical College, Bombay, he underwent a course in ophthalmology. He started practice at Karad, N. Satara, in 1946.

DR. A. L. WALIMBE

He was the Hony. Secretary of the Karad Branch, I.M.A., for several years and took a very active part in the uplift of the branch. He was an active member of the Rotary Club and the Karad Social Club. He was Medical Officer of the Burmah Shell Depot, State Bank of Karad, Montessori School and Kamala Nehru Training School, Karad. He was very sympathetic to his patients and this earned for him great popularity amongst them.

He was operated at Vellore for tumour of the lacrimal gland in 1958. On October 14, 1959 he passed away suddenly after being in an unconscious state for a short while. He leaves behind his wife, three daughters and one son.

YOUR QUESTIONS

Correspondents should give their names and addresses (not necessarily for publication) and include all relevant details of the questions which should be typed. Questions of medical interest only will be accepted for this section. They should be sent in a separate envelope marked "Your Questions". Questions of general interest will be published in preference. Lack of space precludes answering all the questions received.

Q. A male patient, aged 28 years, married, a strict vegetarian with jawar bread and rice as his main diet, is having phosphaturia for the last 3 years.

After allowing the urine to settle for 10-15 minutes, nearly 1/3rd of the quantity settles down as sediment. The urine is acidic in reaction.

Please let me know the mechanism (physiological) by which such large quantities of phosphates are passed and the treatment and diet to be prescribed.

Ans. Phosphaturia usually indicates decreased acidity of urine. Normally urine contains phosphates in solution. If due to any reasons the reaction of urine becomes alkaline there is a chance of precipitation of phosphates.

The patient here is a strict vegetarian, so it is likely that apart from cereals (jawar) he also takes vegetables and fruits. Leafy vegetables and acid fruits contain large amount of basic ions and as a result the urine becomes less acid when these basic ions are excreted through urine. Slightly acid urine if exposed to air for a few minutes evolves CO_2 and the reaction becomes alkaline thereby making it suitable for precipitation of the phosphates.

Usually phosphaturia is not a serious condition. There is only a remote possibility of formation of phosphate calculi. Pathologically sometimes large quantities of phosphates are eliminated in the urine in cases of periosteosis, osteomalacia, acute yellow atrophy of the liver, early stages of pulmonary tuberculosis, extreme decomposition of nerve tissues, etc. So presence of these conditions should be excluded.

Principles of treatment to be followed :

1. Acidification of urine.

2. Reduction of phosphorus and basic ion containing diet.

3. Ketogenic diet (casein, whole milk and butter) to be prescribed.

4. Excluding pathological phosphaturia, the patient's confidence should be gained regarding the fact that it is not a serious condition at all, otherwise anxiety itself may give rise to phosphaturia.

Q. A saw-mill is going to be erected at a distance of 140 yards from a hospital. The saw-mill will create noise and raise sawdust into the air. Is it advisable to allow it to be erected at this distance? Can a valid objection be raised against its erection? Within what limit (minimum distance) is it objectionable?

Ans. The Authorities of the Hospital may put their objection with the Directorate of Health Service and also with the Superintendent of Police on the ground that there will be constant noise from the Saw-mill and it will raise sawdust into the air. Both of them are detrimental to the health of the patients living in the Hospital.

There is no limit mentioned but the Authorities concerned always consider whether the distance between the proposed Mill and the Hospital will create nuisance and will affect the health of the patients concerned.

SUPPLEMENT

Journal of the Indian Medical Association

VOL. 34 No. 1 CALCUTTA JANUARY 1, 1960

X MADHYA PRADESH STATE MEDICAL CONFERENCE, JABALPUR, 1959

The 10th M. P. State Medical Conference was held at Jabalpur on November 7-9, 1959. The Conference was held under the auspices of the Jabalpur branch of the Indian Medical Association.

The inaugural ceremony was to be performed by Dr. Kailash Nath Katju but due to some unavoidable engagements he could not come in person but sent his inaugural address. Dr. G. L. Sharma, the Director of Health Services of M. P. State, read his address.

The conference was presided over by the new president of the M. P. State Branch, Dr. Govind S. Wagle of Indore and was attended by delegates from the various branches of the State as also by a number of eminent medicos outside the State. Some of the distinguished visitors to the conference were 1. Dr. David B. Tyler of America who is at present Visiting Professor at Trivandrum Medical College under the sponsorship of American Technical Co-operation Mission. 2. Dr. W. Grillmayr, the psychiatrist from Colombo. 3. Dr. H. Roy the famous cardiologist of Calcutta and 4. Dr. K. C. Dube of Agra.

Dr. M. G. Harshey, chairman of the Reception Committee, welcomed the delegates and the distinguished visitors to this historic city of Jabalpore. In a short speech, he described the New Madhya Pradesh as a saga for romance, chivalry, nature's splendour and untapped potentials. He said "whereas our state is such a colourful entity, it at once presents a multitude of problems of extraordinarily complicated nature. Among these problems, the problem of human health is indeed a fundamental one."

After the organising secretary, Dr. V. P. Khare who also is the Hony. Secretary of Jabalpur Branch, read the messages of goodwill and blessing sent by some emi-

DR. V. P. KHARE
THE ORGANISING SECRETARY OF THE CONFERENCE

DR. M. G. HARSHEY
THE CHAIRMAN OF THE RECEPTION COMMITTEE

nent persons as also the report of the activities of the Jabalpur branch, Dr. G. L. Sharma read out the inaugural address sent by the Chief Minister. In this address, the Chief Minister expressed his appreciation of the services of the medical profession. He discussed the rural health problems and requested the members of the medical profession to come forward in large numbers to the relief of human suffering in rural areas. He spoke highly of the wonderful advances made by medical science in recent years.

Dr. G. S. Wagle then delivered his presidential address.

In the past report of the conference I have noticed a wailing strain, that neither the local government nor the central government pay any attention to the resolutions we pass in our conferences; that the governments do not consult the State or Central Medical Associations in matters affecting our profession or medical education. We are not represented on local bodies as municipalities, corporations, labour courts, on planning committees nor on local government committees. It is necessary that our Association must have representation on such bodies but then I would ask whose fault is it? It is easy to put the blame on the Government for anything and everything. But my humble opinion is that we as an Association are to be blamed. We are not stronger in number; we are not yet well organised. We have yet to have that ideal unity which will command respect, which will give us dignity. Unitedly if we stand, there is no power in the world that will not listen to our demands, least of all, our democratic government; where the popular demand has got to be respected and fulfilled. Those alien bureaucratic government days are gone; when we had to beg for everything and had to be satisfied with whatever bread crumbs they threw at us. We, now, in our free Independent country must understand the force of organisation. If our political leaders do not comply with our just and fair demands we should follow the same principle of agitation which they themselves practised; and the only language they understand. Therefore, please let us get all the scientific medical practitioners in the Madhya Pradesh State, on our membership register, let us be united in purpose and let us put our demands before our representative government. I am sure, that will receive prompt and due consideration. During our deliberations to-day and for the two days to follow, let us concentrate on making our organisation stronger, in number and in bridging the gaps that separate our members working in different sectors. Let us build those bridges with the bricks of friendship and with cement of mutual understanding. In our scientific sessions we shall exchange notes of our experiences; and in our business sessions our deliberations will help us evolve into a better and stronger Association of medical men of Madhya Pradesh.

We have about three thousand registrable graduates and licentiates in our State. It is not possible to obtain the exact number as our State has not yet adopted Medical Registration Act. We hope that in the near future the State will introduce the registration system which will automatically stop quack practices. Our membership is about seven hundred. We should this year organise a drive for adding maximum members to our register. If we succeed in raising the dignity of our Association then I believe we shall create an atmosphere which will induce each and every medical man in Madhya Pradesh to register with us. In my opinion the duty of our Association would be to expand our membership, get organised, work for the beaefit of the members of the Association and to help them in their difficulty. All this means that we should have permanent headquarters somewhere in the State and we must also collect decent funds. Such central organisation in the State is essential as only then we can not only protect the interests of our members but help raise their ethical standard and help make our Association a dignified, respected, and honoured body of medical profession. Thus organised we shall be in a position to render every social service that is expected of the medicos.

RURAL MEDICAL AID :

Medical Services to urban areas is not a great problem as most of the big government hospitals are located in cities and general practitioners have also settled there. It is the medical aid to the rural areas that our Social Welfare State is worried about. We have a population of two crores, and seventy lacs in our State. Out of this thirty one lacs are urban and two cores and thirty nine lacs are rural. It is but natural that the attention of our free Independent Social Welfare State should turn to improve the lot of our villagers by providing them with the modern amenities of life. This colossal rural problem can only be tackled at government level. We at the most can co-operate and help the government in its constructive plans. There is always a complaint by governments of almost all the countries that qualified medical men are not willing to go to the rural areas. This is a problem even in so advanced a country like U.S.A.

I have two humble suggestions to make to our government in this connection, taking it for granted that it is really sincere in its intentions in giving medical facilities which will be within easy reach of every village. The government has resources to build hospitals and dispensaries; but its greatest headache is to find doctors to man them. There are about four hundred vacancies in our Government Medical Services. I would suggest them two alternative schemes to meet this situation.

First, let their City and District Hospitals be manned by honoraries from among the general medical practitioners; utilise the physically fit and mentally alert retired medical men and remove their highly paid staff to district and rural areas. This will be a good solution of this problem in the present circumstances when we are so short of hands and when there is no incentive for younger graduates to go to the rural areas. The principle is less pay for the city doctors and more pay for those that will go to the rural areas.

Second, Lend and Lease rural dispensaries. The Government builds a compact building with living quarters dispensary, a small surgery, a small clinical laboratory (with microscope, blood count sets etc.), one jeep, one 16 mm. cineprojector, a dry celled battery radio set. This will cost the government, as I have worked out roughly Rs. 80,000. Now having built such a unit in even a remote rural area, they can advertise, to get a medical graduate who will take this unit on loan. He pays back to the government in easy instalments from his private practice in the community he serves. Rules regarding his consulting fees, visit fees, mixtures, laboratory examination fees be framed. This should be made known to the village community. The areas of his beat may be on the basis of either ten miles radius or about three thousand population. Such units are likely to attract young graduates to rural areas, since in course of time the units will be their property and the Government will realise the capital invested. This scheme of Lend & Lease fills up all deficiency of present rural dispensaries which are being manned by low paid Assistant Surgeons. It is easy to advise that medical men should have missionary spirit. But such advisers scarcely take the trouble of ascertaining how nicely the Foreign Missions look after the personal comforts of the doctors even when they work in the remotest parts of the jungles. When our governments cannot provide even the ordinary amenities of life at the Tehsil level, how do they expect the young medical gradnates trained in city colleges to go to the remote rural areas? It is futile to appeal to the medical profession to render their medical aid to the villages with missionary spirit.

The subject of rural medical help is dearest and nearest to the heart of the Chief Minister of our State.

He has the credit of launching a wonderful scheme of "Matru-Grihas" in villages. So far there are about 1000 such Grihas. The idea is extremely nice. But the success depends on the sincerity of the village people, the integrity of Block Development Officers, and the alertness of the Health Department. I wish Dr. Katju follows it up during his tours. Let Matru-Grihas be real Matru-Mandirs and let the villagers keep them clean as temples. I would suggest that out of the 1000 Matru-Grihas at least 100 be so constructed as to stand as models for the remaining 900.

OTHER SCHOOLS OF MEDICINE :

The Government has opened Ayurvedic, Unani and Homoeopathic dispensaries, on the plea of providing cheap aid and on the principle that something is better than nothing. This will just keep up differences in the medical profession, which is exactly what we do not want. I consider these attempts of government simply waste of public money and energy. What they should do is to incorporate the pharmacopia of all of them in one and prescribe it as a subject for the M. B. B. S. course of the University. The methods of diagnosis of these schools are too ancient and unscientific. Their pharmacopia should scientifically be studied and standardised, and the drugs used just as we use Serpina, Vasaka and others. Ayurved, Unani and Homeopathy, should be university research subjects.

OUR HEALTH DEPARTMENT :

Our members in the medical services have their grievances. They are low paid as compared with the members of the Central Services of the same kind of job. There are frequent transfers particularly from the teaching institutions, which affects the efficacy of the teaching and prevents the new colleges from establishing sound traditions. Some highly qualified people with special foreign training have been given only administrative jobs. These good highly technical men will just rot as higher clerks. Retiring age of government administrative servants should be raised from 55 to 60, and that of technical men to as long as they want to continue, provided they are found to be physically and mentally fit. The integration of medical services have been recently done. There are so many points of dispute regarding seniority, length of service etc. I am sure that the government will consider all these cases on their merit and not on regionalism or favouritism. Usually D.M.O. and D.M.O.H. are kept at one and the same place. But there are few instances where they are not. This is not very convenient and does not allow co-ordination of planned working. In bigger cities like Indore, there is no D. M. O. It causes such a great inconvenience to all and sundry that I would unhesitatingly suggest that there should be either special D. M. O. for such cities or the Hospital Superintendents be made Civil Surgeons for the city.

As it is we are so short of trained nursing personnel. The General Practitioners used to get the services of such nurses for their serious patients on prescribed fees and on request to the superintendent of the big hospitals. This facility has been recently stopped by our own members in the government service. There are Blood Banks, Tissue Banks, and Eye Banks in the Government Hospitals. The general practitioners are not allowed to draw from these banks even on payment. This facility was allowed in the past, but recently it is stopped with the result that some sort of estrangement has come over the two sectors. We expect that the Government servants and private sectors of our members should co-exist on genial terms and establish an atmosphere of goodwill and mutual understanding.

Our private practitioners in the Dry areas of the State are very much harassed by the Dry laws, with regard to their stocks of tinctures and some spirituous drugs. We understand the difficulties of both the authorities and the private practitioners and some formula should be evolved by which the harassment can be eliminated.

MEDICAL EDUCATION IN THE STATE :

We have now four medical colleges in the State and there are two more in the offing. The standard of education is being lowered to meet the growing demand for more doctors. This manufacturing of medical men on mass scale may satisfy the politicians, but it will not be in the interest of the medical profession. It is a short sighted policy and spells of ill omen.

Our text books are in English language; our teaching is in English, but the boys who are admitted to medical colleges have such poor standard that it is very difficult to explain to them the intricate scientific subjects. I have therefore to suggest that English should

DR. G. S. WAGLE
THE PRESIDENT OF THE CONFERENCE

be made compulsory and of Inter Arts standard of 1946, for students to be admitted to the medical colleges. If we want research work to be done by our future medical men, I think it is necessary to make Physics and Chemistry of the standard of B.Sc. for admission. Our governments are expecting research on assembly line. Is it possible to have even ordinary good medical service with basic subjects so low in standard.

There is a stress these days on Audio-Visual Aids to education. For this medical motion pictures are about the best. In my tour, of Europe last year I saw some of these wonderful films. I wish all our colleges engage the services of some artists who will be able to take fine talky films of the wonderful medical and surgical work done in most of institutions and hospitals. Actually,

there should be an Exchange Bureau established at government level and such films be exchanged, free from custom barriers. Televising the operations from the operation room is in vogue in Europe and U.S.A. in teaching institutions and it is found to be a very beneficial aid to educating the medical students.

FAMILY PLANNING CENTRES :

Such centres are being opened by the government as well as by some private organisations. They have a value of creating a public consciousness that getting children is not just a God's gift but rationing of kids at will is possible. I hope the vital statisticians have realised that the increase of population is not only due to increase in birth rate but it is also due to decrease in death rate due to life saving drugs like antibiotics and chemotherapeutic ones. No body will be foolish enough to say that to reduce population the death rate should be allowed to increase. I have one suggestion to make, which may sound rather revolutionary and bold. It is this that the government should legalise abortions or at least adopt a conniving attitude to medical abortions. Increase of population out of proportions, is a national problem and emergent drastic measures as suggested above should be undertaken. This will help implement Family Planning Scheme.

SPURIOUS DRUGS :

Spurious drugs are flooding the market. It is a dangerous practice, not in the interest of health of the Nation. Government have their agencies to deal with such crimes. I wish these agencies are more effective. Smaller pharmaceutical works should merge into larger concerns to eliminate this cancer of anti-social activities.

NUTRITION AND STANDARD OF LIVING :

Our Governments promise us high living standard and ample nutritive food through the Five Year Plans An average man keeps wondering, as to how many such Plans would be necessary to achieve this golden day? Is there any limit to this, sustaining the strain of high taxation and the sacrifices he has to go through? The Nation as a whole can tighten her belt provided there is some time limit. It would be a wonderful thing if the average individual income of today and the 1939 price levels are brought about by the magic wand of our Food Minister Shri Patil. Otherwise I do not see any good prospects in the near future.

MEDICAL PROGRESS IN OUR STATE :

Bhore Committee's recommendation are that there should be one Primary Health Centre, with 100 beds each for 20,000 population and three subsidiary centres with 25 beds. This works out to one hospital for 115 persons. Factual data available to me of the existing conditions in our State are not up to that standard. We have 4 City Hospitals and 43 District Hospitals with a bed strength of 12,255 beds. The proportion to the population of our Madhya Pradesh State which is about 270 lacs, is one hospital bed to 2,240 persons. Medical aid by allopathic doctors is in proportion of one doctor to 10,000 persons. Even with the addition of 6,000 more beds which are proposed to be added in the 3rd Five Year Plan, it is not going to meet the ideal requirements at all.

We are also miserably short of the most important supporting wing of the medical profession, and that is trained nursing personnel. There are a few Nursing and Midwive's training Centres in our State. Number of trained personnel they put out is inadequate. I think the government should pay as much attention to this branch as they pay to the medical colleges. Besides, the status and the pay scales of nurses and midwives should be raised and the treatment meted out to them in the hospitals by the doctors should be dignified so that educated girls will be attracted to this honourable profession. In order to achieve better results and to make the Health Department more efficient and progressive it is necessary to have better guidance from the top, a broader outlook on the part of administration and above all a keen foresight to utilise all the opportunities.

Total budget estimates on receipt side for 1959-60 is Rs. 179 crores plus a few lacs out of which, provision for the medical department is only 2 crores and 55 lacs. In pre-independance days we were clamouring for 50 per cent of the revenues to be spent on nation building departments. But the above figures tell us a different story. We have only to be satisfied with the idea at the present stage that our heavy industries are yet to be built, our self sufficient economy is to be built and then scores of years after, if peace is not disturbed, we shall be in a position to provide adequate help for our nation building departments.

CONCLUDING REMARKS :

In concluding I would like to make two statements with earnest appeals to you all. During my travels in our country from north to south and from east to west in the last four years, I noticed such feverish activity of building dams, canals, factories, colleges, hospitals, shipbuilding, electricity, chemical industries, and what not. There has been wonderful achievements in many fields in such a short time. There appears an all round prosperity, and yet an average man somehow feels frustrated and has developed a defeatist mentality. It is worth while to find out the causes of this nationwide discontent inspite of so much progress in various departments.

My second suggestion and an appeal from the bottom of my heart is to the members of our Association. We must get united and stronger in number, get well organised, be vocal in our demands. In democracy if we do not acquire these virtues I am afraid we shall be no where. Let us during these three days get closer in friendship and learn from each other's professional experience. I appeal to you in the end to get mentally integrated, to enlist as many members of our profession, to consolidate our Association and make it United, Strong and Effectice. Thus equipped we march on to the aid of the sufiering humanity.

Exhibition was declared open by Dr. Grillmayr of Colombo.

On 8th and 9th November the scientific sessions were held. A symposium on Hypertension was introduced.

One of the highlights of the Conference was that a drama "Manmoyee Girls School" in Hindi was staged, exclusively acted and directed by the members of medical fraternity only.

The following resolutions were passed at the Conference :

1. In view of the fact there is already a registrar appointed, this Conference earnestly requests the State Government to expedite the compilation of a register of qualified medical men of the whole Province.

2. This Conference brings to the notice of the Government with great regret that quackery is highly rampant in this Province and requests the Government to take suitable measures to eradicate it by suitable measures and legislature.

3. This Conference views with great concern the discrimination which is being exercised regarding the levy of Sales Tax in Allopathic Medicines only and earnestly requests the State Government to exempt Allopathic medicines from Sales Tax.

4. This Conference recommends to the State Government that since the Jabalpur Medical College Hospital is under construction, it will see that al least a "200-bed" T. B. Hospital is constructed along with it to facilitate teaching and to meet the long and urgently needed demand of the suffering public.

5. This Conference is of considered opinion that a refresher's course for General Practitioners of the State be introduced in every Medical College of the State, on a nominal fee, as practised in other States.

6. The Conference reiterates the resolutions passed in the last "IX" M.P. State Conference and notes with regret that the State Government has not given any serious consideration towards those resolutions. It further resolves that the Government be requested to give serious consideration to the resolutions passed in this conference.

II MAHARASHTRA TERRITORIAL MEDICAL CONFERENCE, KHAMGAON, 1959

The 2nd Maharashtra Territorial Medical Conference was held at Khamgaon in Vidarbha, under the auspices of Khamgaon Branch, I.M.A., on October 24-26, 1959. Venue selected was the premises of G. S. College of Science and Arts and Commerce, Khamgaon. Working Committee was elected with (i) Dr. J. V. Barve, as Chairman, Reception Committee, (2) Dr. M. G. Saoji, as Organising Secretary and (3) Dr. P. M. Chande, as Joint Secretary and Chairman, Souvenir Committee.

About 200 delegates from various places attended the Conference. The programme started as per schedule. On Saturday, the 24th October 1959, Dr. J. V. Barve, Chairman, Reception Committee, welcomed all the guests.

DR. J. V. BARVE
THE CHAIRMAN OF THE RECEPTION COMMITTEE

He described the importance of the town, in his welcome address. He also pointed out that though Khamgaon is not a district, it is, at present in all respects fit to be converted into a district. He further referred to the difficulties in obtaining morphine and pethidine which are life saving drugs commonly required and also to the particular procedure prescribed for obtaining methylated spirit.

Hon'ble Shri M. S. Kannamwar delivered the inaugural address, inviting attention to some chief aspects of the problem of health, namely the rendering of medical relief to rural areas, organising teaching the research facilities and population control. While stressing importance of rural health, he made a strong appeal to young doctors to work in villages in a missionary spirit and thus co-operate in making government's Rural Health Programme, a success. As regards Medical Education, it was shown by providing statistical figures, that admissions were being increased in the existing colleges in the State and more medical colleges might have to be opened in the Third Five Year Plan. It was further announced that provision was also being made for the full-time teaching staff and equipment for research.

Dr. B. B. Kirtane, in his Presidential Address while speaking on the problem of medical education said, that emphasis should not be laid on merely the marks secured by the candidates but it should be laid on the aptitude and intuition of the candidates. The recommendation of a uniform standard of medical education and the subsequent abolition of L.C.P.S. Examination led to the opening of Ayurvedic Colleges all over the State. In practice it was found that these Ayurvedic doctors adopted allopathic line of treatment and were using all allopathic medicines and antibiotics. This mixture of pathies satisfies nobody, neither the doctor, the patient, nor the institution, where he is educated. Moreover,

DR. B. B. KIRTANE
THE PRESIDENT OF THE CONFERENCE

these Ayurvedic institutions are manned by allopathic doctors and in the hospitals under Ayurvedic line of treatment, there is a mixture of Allopathy and Ayurveda. It was further submitted that an efficient survey should be undertaken with a view to find out inefficiency of equipment, ability of the staff to impart education and to ascertain whether there is sufficient number of beds for the students to learn, in the hospital.

The problems like Medical Relief, Public Health and Sanitation, and Hospitals were also given due attention, in the presidential address. In order to relieve malnutrition it was suggested that medical men should guide the public in the necessary improvements needed in their dietary. Lastly, a hand of co-operation was offered on behalf of I.M.A. to the Government and its

health department to maintain a standard in medical relief, and the execution and extension of health schemes.

Dr. G. M. Phadke of Bombay, while inaugurating the Scientific Session, pointed out that the information given in the text book is too limited to cope with various aspects of the diseases met in the routine practice. The journals and medical literature received by post from the various manufacturing firms provide the only solution to keep the proctitioner in touch with the recent development and thereby to supplement more knowledge, though it is rarely possible for him to spare enough time during his busy practice to go through these journals. To get over these difficulties, a suggestion was made to form a "Journal Club". The local association, or, if not possible, senior practitioners may be induced to subscribe the journals. Meetings may be held once a fortnight, when one or two young practitioners are to be entrusted with the task of reviewing the journals of the last fortnight. Thus the local practitioner is given the idea of the development in the medical world, without themselves going through these journals. Further the seriousness of the problem of "Family Planning" was brought to the attention of all.

The Pharmaceutical and Leprosy Exhibition was declared open by Dr. R. V. Vardekar of Wardha.

Eminent specialists, in all branches of Medicine, from all over Maharashtra read interesting papers on various subjects of importance in the scientific session of the conference. In all twentyone papers were read.

BRANCH NOTES

ALWAR BRANCH—The members of the branch condoled the sad death of Dr. R. M. Sharma a member of the branch who passed away on 13-11-59.

CHIKMAGALUR BRANCH—The clinical meeting of the branch was held on 3-12-59. Dr. B. S. Venkatraman Setty, D.M.O. presided. Dr. H. Shamashastry, Dy. Director of Public Health in Mysore spoke on National Malaria Eradication Programme.

DEORIA BRANCH—The annual general meeting of the Deoria branch was held on 27-9-59. Sixteen members were present. The annual report for 1958-59 was presented. The report shows that 12 meetings were held during the year. Clinical cases were demonstrated and discussions on clinical matters were held. Office-bearers for 1959-60 were elected with Dr. N. C. Jain as president, Dr. R. S. Gupta as vice-president, Dr. G. B. Chattaraj as secretary; Dr. R. Chandra as joint secretary; Dr. S. N. Mukherjee as librarian; and Dr. Khurzana as auditor. Dr. S. C. Acharya was elected to the Central Council.

JALGAON BRANCH—A meeting of the branch was held on 15-11-59. Dr. S. V. Sahashra Budhe spoke on Harmless Nonsense of the Heart. Drs. Bhate, Sharma and Kango of the Public Health Department spoke on the Eradication of Malaria.

KANDI BRANCH—The annual meeting of the branch was held on 27-9-59. Dr. B. K. Chakravarty presided. The report of the branch for 1958-59 shows that 5 meetings including Bejoya Sanmilani were held. At the Bejoya Sanmilani, the members and about 200 guests were served with dinner. Regarding the failure of the Bengal Branch I.M.A. to condole the death of Dr. R. G. Das, president of the branch, the meeting noted with satisfaction the action proposed to be taken in this matter by the Bengal branch I.M.A. But the inactivity of the Central Office of I.M.A. in this matter was very much regretted.

The meeting elected an executive committee for 1959-60 with Dr. B. K. Chakravarty as president and Major S. Ghosh as secretary.

SOUTH CALCUTTA BRANCH—The annual general meeting of the branch was held on 10-11-59. Dr. R. C. Sen was in the chair. Office-bearers for 1959-60 were elected with Dr. R. C. Sen as president, Dr. C. C. Bhattacheryya as secretary and treasurer.

TANJORE DISTRICT BRANCH—The monthly meeting of the Association was held on the 26th April 1959 with Dr. N. R. Subramanyan in the chair. Nominations were made to the offices of the President and three Vice-presidents to the I.M.A. Dr. P. Visvanathan spoke on "Anaemias". Dr S. Narayanan was "At Home".

The monthly meeting of the Association was held on the 31st May 1959 with Dr. N. R. Subramanyan in the Chair. A resolution requesting the Government to take suitable action against quacks practising the Allopathic system was passed. Dr. R. Balakrishnan, of the Government Ophthalmic Hospital, Egmore, spoke on "Uncle's daughter—What price?". Dr. P. Narayana Rao was 'At Home'.

The monthly meeting of the Association was held on 28th June 1959 with Dr. T. M. Pillay in the chair. Dr. J. D. Kanakaraj, Tanjore, spoke on 'Plastic and Reconstructive Surgery in Leprosy. Dr. T. R. Ramachandran was 'At Home'.

TARAKESWAR BRANCH—The annual general meeting of the branch was held on 8-11-59. Bejoya greetings were exchanged. Three new members were enlisted. Office-bearers for 1959-60 were elected with Dr. S. N. Mukherjee as president; Dr. H. S. Dutta and Dr. R. R. Paul as vice-presidents; Dr. R. K. Goswami as secretary; Dr. C. S. Dhara and Dr. N. K. Dhara as asst. secretaries. The branch donated Rs. 50/- towards flood relief in West Bengal Chief Minister's Fund.

UDIPI BRANCH—A meeting of the branch was held on 10-11-59. Dr. R. P. Koppikar presided. The members condoled the death of Dr. S. R. Pai, the founder president of the branch.

UTTAR PRADESH STATE BRANCH—The 1st meeting of the Working Committee of the branch was held on 24-10-59. Twelve members were present. The proceedings of the meeting of the Working Committee held on 13-9-59 were confirmed. Quarterly accounts of the State Branch from July 1959 to September 1959 were passed. The audited accounts for the year 1958-59 were confirmed. The annual report for 1958-59 were adopted after a few corrections. The Budget for 1959-60 was approved. Names of 9 doctors for Postgradnate training and Internship were forwarded to the Central Office. The invitation of Varanashi branch IMA to hold the State Medical conference in 1960 were recommended to the U.P. State branch council.

VISAKHAPATNAM BRANCH—A joint meeting of the branch and the Academy of Medical Sciences was held on 7-11-59 with Dr. P. Tirumalarao in the chair. A sum of Rs. 200/- was sanctioned for Flood Relief Fund. The election of President and vice-presidents for the provincial branch took place. The secretary announced Dr. P. Gurumurthy Memorial Prize Competition.

X ASSAM STATE MEDICAL CONFERENCE, JORHAT, 1960

The 10th Assam State Medical Conference which was scheduled to be held on 2-4 January 1960, will be held on the 16-18 January, 1960 at Jorhat. A Reception Committee has been formed with Dr. J. K. Soikia, Rtd. D.H.S. as the Chairman and Dr. S. N. Sengupta as the General Secretary. Scientific and Pharmaceutical exhibition will be held and a Souvenir published in this connection. Members are requested to co-operate and contribute scientific papers.

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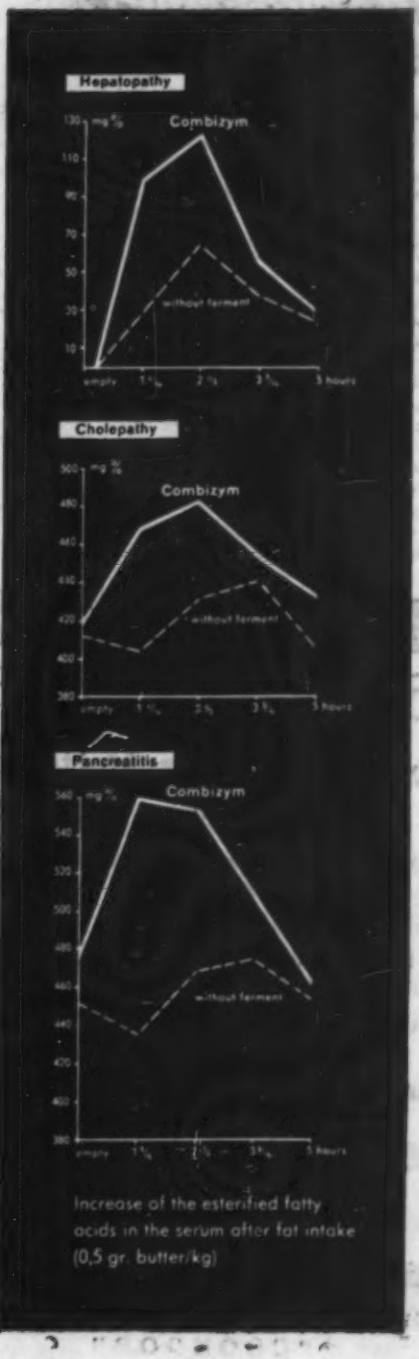

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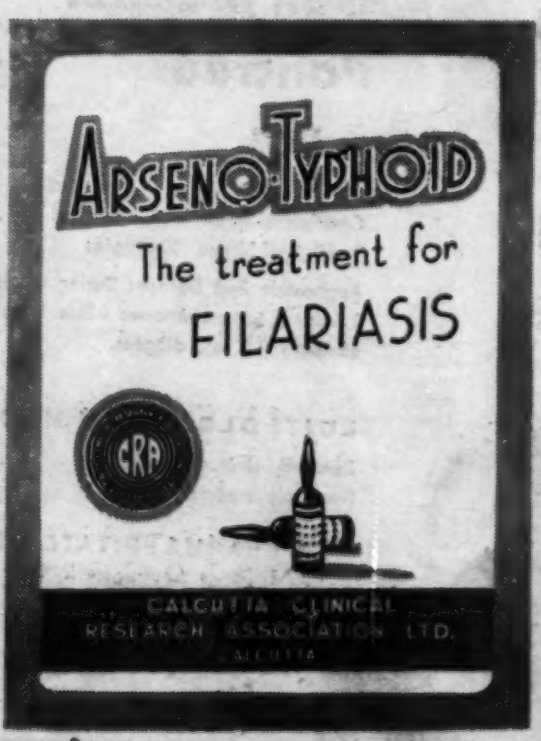

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1. *Broceland, F.J.: Texas State J. Med, 51 : 287, (June) 1955.*
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